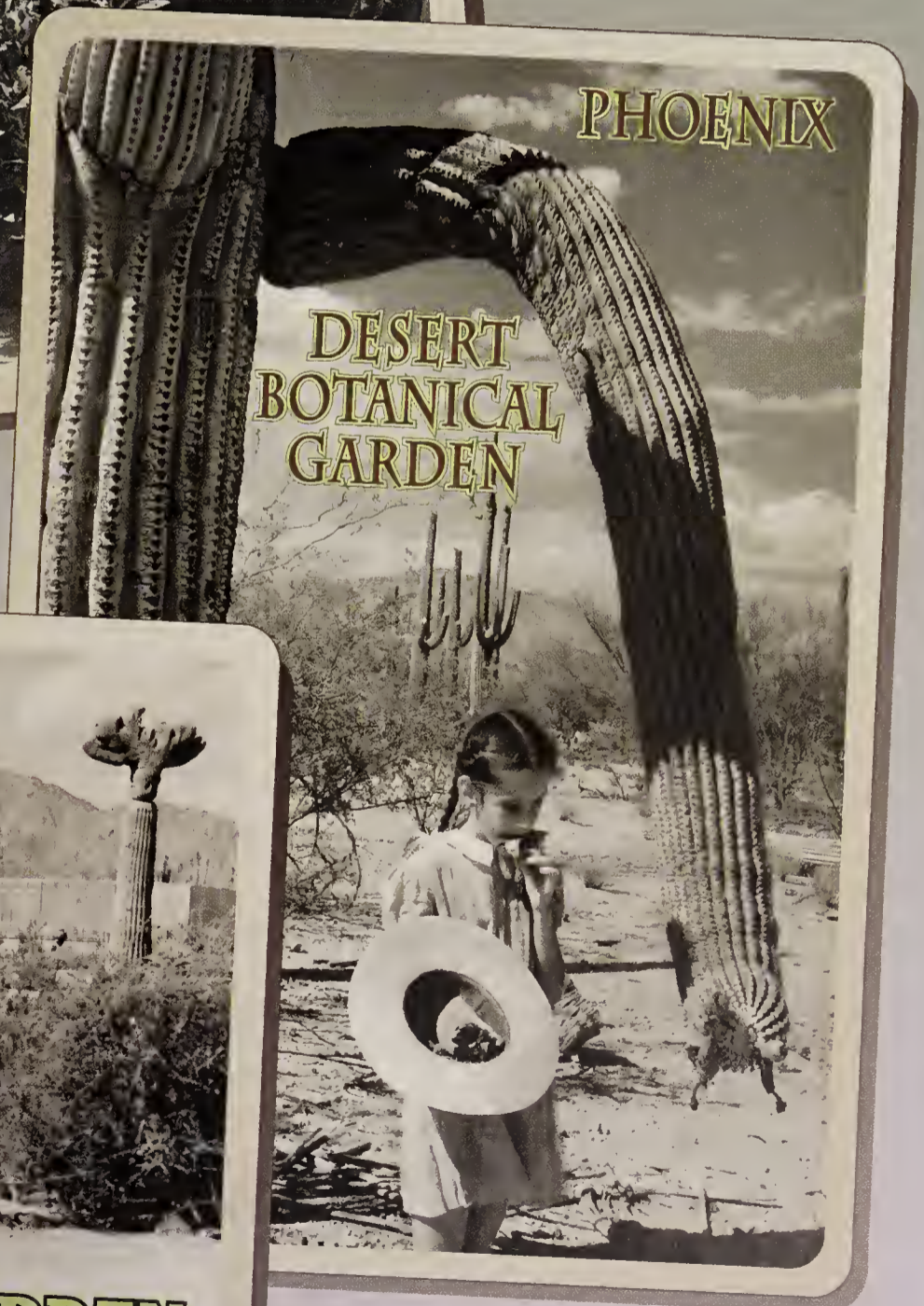


THE SONORAN QUARTERLY

The bulletin for members and friends of the Desert Botanical Garden, Phoenix, Arizona March 2004/Volume 58, No. 1



CELEBRATING
65TH
ANNIVERSARY





Making History

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THE SONORAN QUARTERLY

March 2004
VOLUME 58, NO. 1

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When I contemplate the incredible vision Gertrude Divine Webster and her contemporaries put in motion when they founded the Garden in 1939, I wonder how we will measure up. Are we planning for the Garden's next sixty-five years with the same foresight and passion that our founders so effectively demonstrated? Are we planting specimens now that after six decades will



Gertrude Webster (r) at ground breaking in 1939.

be as stunningly beautiful as the cardons, boojum trees and creeping devil cacti that were among the first plants in our Garden's collection? And are we fully engaging our community in all aspects of the Garden's mission—education, research, conservation and exhibition?

I hope so. In fact, I believe so. But it never hurts to check...

As we plan for the future, we aren't thinking about new buildings or new trails at the Garden. Instead what we envision is a process of constantly improving the existing core trail and each of the four themed trails. This, of course, will include the best on-going care for the plant collection—pruning, thinning, weeding, and propagating. But we also foresee more happening to the Garden's displays over time.

Throughout various phases of the Garden's history, we have focused on different aspects of our mission—acquiring plants for the collection, conducting research, promoting conservation, and educating the public—and some of our current displays show a singular focus on just one of these priorities. What we hope to do over the next twenty years is to make sure that each bed in the core Garden is planted in a way that fully

integrates all four of these themes—being beautiful for beauty's sake, featuring plants with genuine conservation and research value, and weaving an educational message that imparts to all visitors a stronger knowledge of botany and a better appreciation of desert ecosystems.

We expect that improving the core garden in this way will take as many as twenty years with, on average, one-twentieth of the beds and displays being upgraded each year. If we are successful, the core garden will increase in beauty, scientific importance and educational relevance with each year that passes—just as those cardons, boojum trees and creeping devil cacti have done since 1939.

We have similar plans for the themed trails. The Harriet K. Maxwell Desert Wildflower Trail is still maturing and grows more beautiful each year. At this point, all we have to do is add water if Nature doesn't. Our ethnobotany trail, the *Plants and People of the Sonoran Desert* Trail, will soon receive major renovations to both its exhibits and interpretive signage—thanks in large part to funds raised by the Volunteers in the Garden and a hoped-for grant from the National Endowment for the Humanities. The Sonoran Desert Nature Trail remains one of the most popular at the Garden, although its natural beauty needs additional foundation plantings as well as more opportunities to learn about biodiversity in this unique ecosystem. And finally, the Center for Desert Living Trail's message about water and energy conservation remains strong, but we want to add a series of themed demonstration gardens—perhaps a formal succulent garden and a Zen garden—to show our visitors different styles of planting they might use at home.

As you can see, our plans are evolving and will continue to do so. What's most important to us is that they be worthy of the proud history of our institution and that sixty-five years hence they will inspire the same sense of pride that we feel today for all our Garden has achieved in its first sixty-five years of existence. ☀

Ken Schutz,
The Dr. William Huizingh Executive Director



Kenneth J. Schutz

Photograph by Adam Rodriguez



CONTENTS

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

ARTICLES

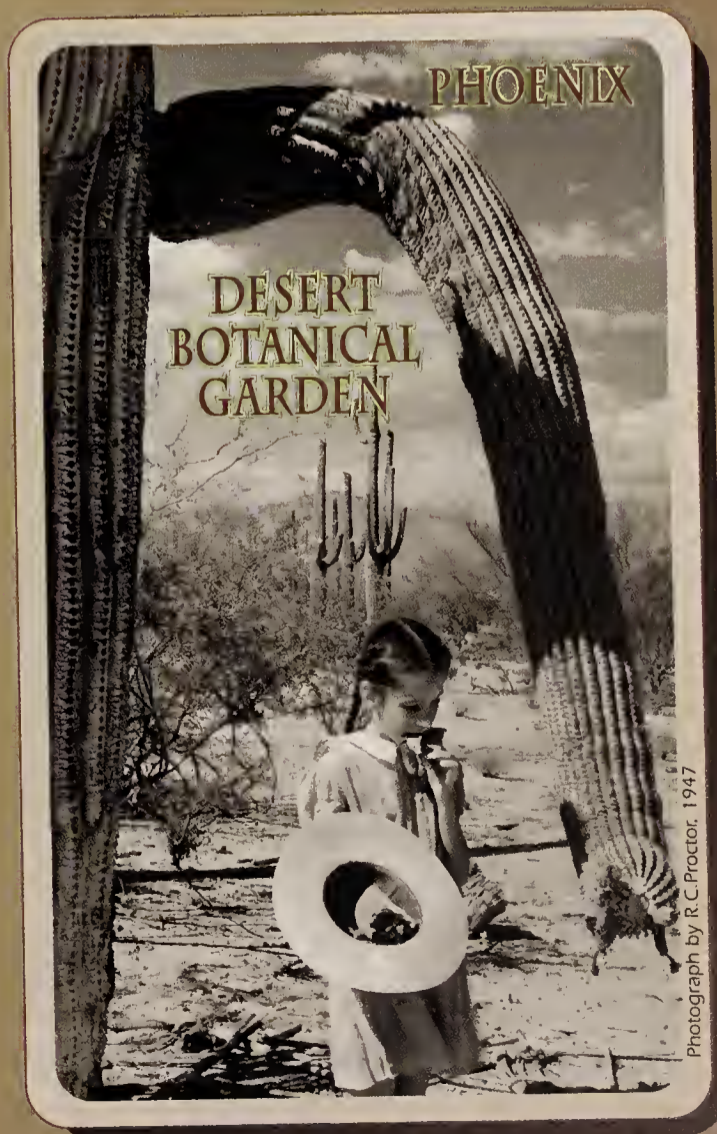
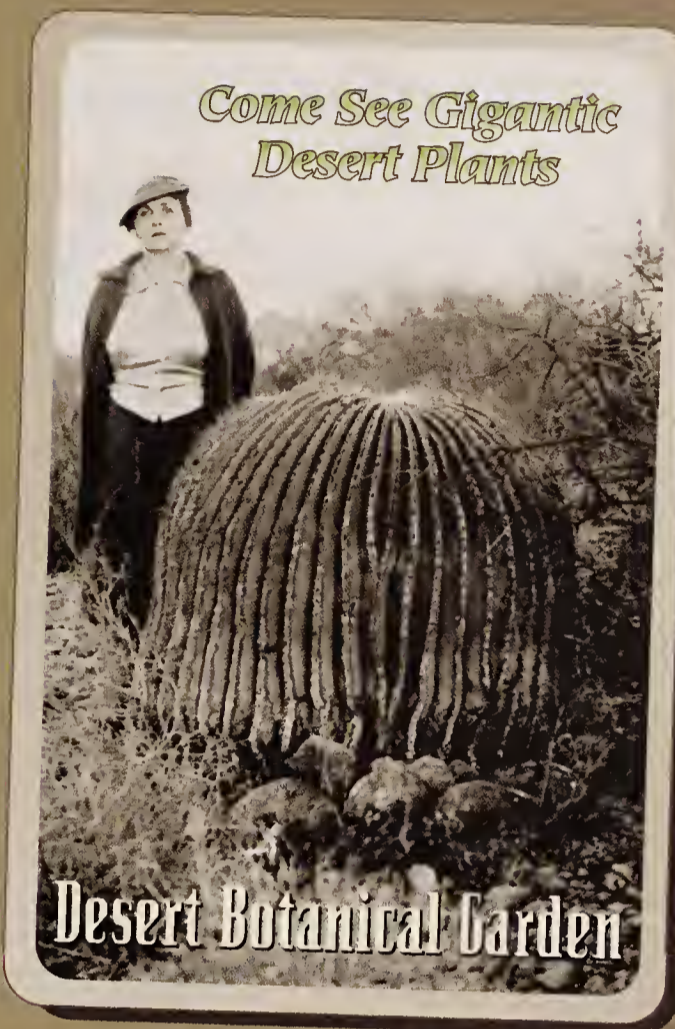
- The Garden celebrates its 65th anniversary:
Looking back while moving forward 4
- A vision to frame a beguiling collection
by Cliff Douglas, *Trustee Emeritus* 5
- My personal Garden
by Sharon J. Proctor, Ph.D. 8
- Heat and chicken wire
by Patrick Quirk, *Horticulturist* 11
- A rare day at the Garden
by Robert Breunig, Ph.D. 12
- Thirty wonderful years
by Wendy Hodgson, M.S. 14

FEATURES

- Desert Journal: Making History by Ken Schutz 2
- Garden News 16
- Celebrate the Wildflowers
 - Dinner on the Desert
 - Another Successful Luminaria
 - Music/Jazz in the Garden
 - Butterfly Pavilion
 - Agave Festival
- In Appreciation 18
- Calendar of Special Events 20

ON OUR COVER

These photographs were taken by R.C. and Claire Meyer Proctor and are used courtesy of their daughter, Sharon, whose childhood memories of being in the Garden appear on page 8.



65th ANNIVERSARY



My favorite memory of the Desert Botanical Garden is:
 My wedding day on March 22, 2003.
 Then returning to the Garden this holiday season to see the luminaries.
 —Megan Harman

The Garden celebrates its 65th anniversary: Looking back while moving forward

The Desert Botanical Garden has been celebrating the beauty and enduring appeal of the desert's native plants for 65 years.

Since its founding on February 12, 1939, by Gustaf Starck, Gertrude Divine Webster, and other members of the Arizona Cactus and Native Flora Society, the Garden has collected, studied, displayed, and explained the fascinating and unique plants of the Sonoran Desert and the world's other arid lands.

Through those years the Garden has survived water shortages, war-time shelling by "friendly" fire, failing economic times, anonymity and neglect, and encroaching urban development.

It has also been nurtured by ten executive directors, a growing population fascinated by the desert and its "exotic" plants, and a constant cadre of conservation-minded citizens, visionary boards of trustees, a dedicated staff, and faithful volunteers.

DESERT BOTANICAL GARDEN



Photograph by R.C. and C.M. Proctor

It has grown from a small planting of cactuses so insignificantly placed that earliest visitors wondered "if anything has been planted yet" to a stunning display of arid-land plants organized by four themed trails which loop from a central

brick path through the core of the garden. The Garden's 92-member staff and volunteer corps of 500 carry out the mission of the Garden in a complex of beautiful buildings tenderly laid into the landscape's topography.

Membership application form by local cartoonist Reg Manning.

APPLICATION FOR MEMBERSHIP

IN THE

ARIZONA CACTUS AND NATIVE FLORA SOCIETY

SPONSORING THE

DESERT BOTANICAL GARDEN OF ARIZONA

IN PAPAGO PARK—Mail Address, P.O. Box 5415, Phoenix, Ariz., 85010

I DESIRE TO BECOME A _____ MEMBER
 OF THE ARIZONA CACTUS AND NATIVE FLORA SOCIETY.

MEMBERSHIP FEES	
FOUNDER	\$500.00
LIFE	100.00
Annual	
BENEFACTOR	50.00
SUSTAINING	25.00
SPONSOR (Family)	15.00
BUILDER (Single)	10.00
GRADE or H.S. STUDENT	2.00

I ENCLOSE \$ _____

NAME _____

ADDRESS _____

(PLEASE PRINT—WE CAN'T READ 'RITIN')

REG

At the Garden are rare plants and seeds, rare botanical prints, a library of sixty-five thousand volumes, an herbarium with 50,000 mounted plant specimens, as well as at least 21,000 accessioned plants and another 40,000 plants used for their beauty.

This year *The Sonoran Quarterly* celebrates the Garden's history with remembrances written by some of the people who helped make that history. Their collected stories do not offer a panoramic view of the Garden's past, but give us instead revealing glimpses through the windows of their hearts. The stories of people's passions for a place are its genuine history. Please enjoy this ongoing series.

My favorite memory of the Desert Botanical Garden is:
Taking our grandchildren through the Butterfly Pavilion.

—Beth and James Cullison

—Gloria and Stuart Hollingsworth

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

A vision to frame a beguiling collection of plants

By Cliff Douglas, *Trustee Emeritus*

After our family moved in the 1980s to a new home located in pristine Arizona desert, landscape architect Steve Martino recommended that we visit the Desert Botanical Garden to learn more about our environment. We did, and it became a part of our lives. In 1985 my daughter Susan became a docent and my wife Marilyn became a volunteer at the Gift Shop. In 1987 I became a member of the Desert Botanical Garden's Board of Trustees and served for the next six years. Later my son, architect John Douglas, would design the new buildings that were opened in 2002.

The following is a glance back at that enjoyable and enlightening journey:

In 1987 Dr. Robert Breunig was the garden's director, James Loudon was president of the Board and Becky Whitney, later followed by Pat Ebbert and Mary Cochran, was president of the Garden's Friends group.

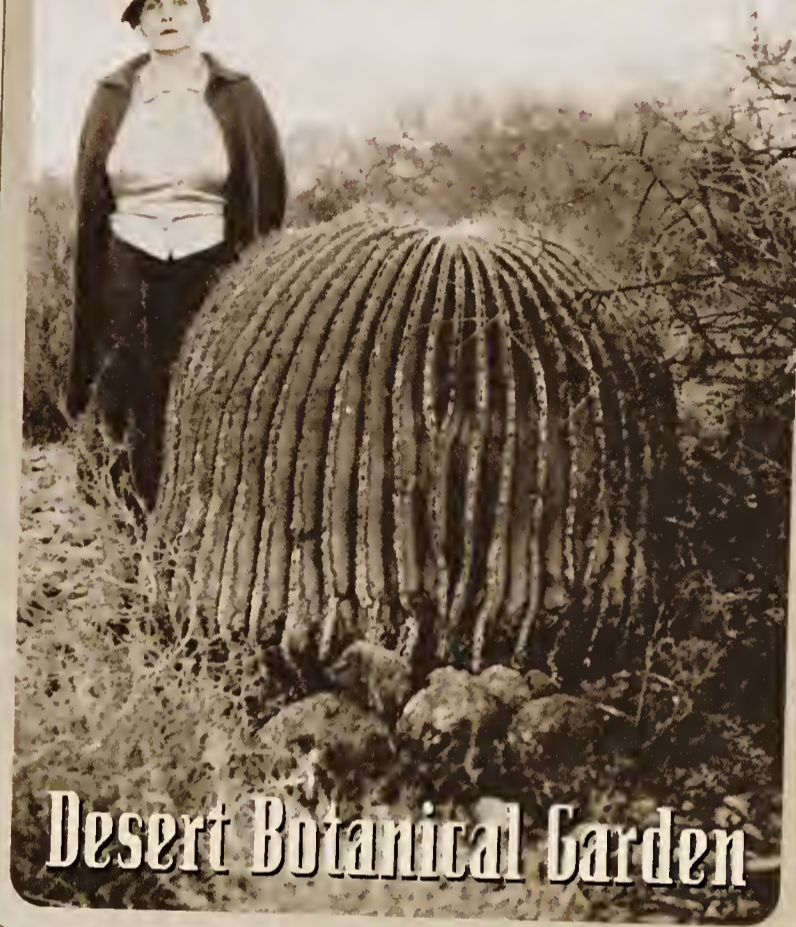
Facilities in 1987 consisted of a gift shop that also served as a ticket booth to enter the garden. Archer House was used by the education department and volunteers. Webster was used for meetings as well

as offices for administration, accounting, research and horticulture. Richter Library and Earle Herbarium were the other major structures.

Restroom facilities for the visitor were located just east of Webster. The path system was mostly blacktop and there were few drinking fountains. Behind Webster there were a couple of old storage sheds and a make-shift carport for the director. A power line intruded across this unsightly part of the Garden. If a visitor came to the Garden, he found few amenities. There was no place to buy a sandwich, and drinks were available only at the vending machine in the Gift Shop. If you were at the Garden in the morning, you had to leave in order to have lunch. Staff and volunteers made do with what the existing facilities provided.

The Garden, however, and its collection of plants had become a beautiful and

*Come See Gigantic
Desert Plants*



Gertrude Divine Webster

beguiling place in the years since 1939.

Dr. Breunig had a great understanding and vision of what was needed and he had the enthusiasm and determination to make it happen. The Garden was not only a museum but also a substantial business operation with operating expenses. An income was needed to meet those obligations. Staff and volunteers required sufficient facilities to carry out their many duties from education to research. New staff positions would be helpful, including security personnel. The staff had to be fairly compensated. Visitors would appreciate the amenities necessary to make their visit enjoyable. There were many goals to be accomplished; here are some of the results:

- *Plants and People of the Sonoran Desert Trail* was completed and opened in



The Garden's entrance in 1965.

Photograph DBG archives



My favorite memory of the Desert Botanical Garden is:

The beauty and peacefulness. It was always such a pleasure to come to the Garden. It was the highlight of the week to be able to come and participate with the staff and other volunteers. I was there almost ten years. I miss it a lot. It's one of my best memories of Arizona.

—Tillie Parker



Aerial view of the Garden, late 1950s.

March of 1988. Nancy Swanson, past president of the Board, and Ruth Greenhouse of the Garden staff were applauded for their efforts in bringing this project to reality.

- A master plan was completed to identify and plan for the many improvements that the Garden considered necessary to continue fulfilling its mission. Implementing this plan required substantial financial resources. A major capital campaign would need to be undertaken if the improvements were to become a reality. Thanks to the foresight of board member Jack Whiteman, a new position of development director was added. Jack provided the funding to start this new position, which gave the Garden the means to increase membership, and to solicit contributions more actively. The position has paid for itself many times over in the ensuing years, eventually becoming the department led by Sherry New that would later handle the major capital campaign.

- Dr. Breunig and the Board felt that a major capital campaign should not begin without first conducting a campaign among the board members. These funds would be used to improve the amenities for visitors and was called the Amenities Campaign. Pamela Grant chaired the campaign.

Virginia Ullman led this campaign with a contribution of \$50,000 challenging all Board members to contribute. The entire board willingly contributed, raising \$320,000. Ullman Terrace is named in her honor.

- James Loudon spearheaded efforts to include in the 1988 Phoenix bond election, one million dollars to be used for infrastructure improvements to the Garden.

Phoenix voters approved the bond election. The entry drive now honors this man who gave unselfishly of his time and talents to support the Garden that he cared so much about, until his death in 1989.

- With funds provided by the Phoenix Bond Election, the Board's Amenities Campaign and COMPAS (a local funding organization for charities, now defunct), many needed improvements and additions were made. Webster was renovated and restored; a new food concession and kitchen were added. Ullman Terrace, designed *pro bono* by Steve Martino, replaced the unsightly area south of Webster and offered at last an outdoor site for events. A new water line improved pressure and fire protection. Electric and phone lines were moved underground to improve the Garden's appearance. A new sewage system was installed. A new access from Galvin Parkway and parking spaces were constructed. A new toll booth entry helped clear congestion at the Gift Shop. Drinking fountains and shade islands were added along newly surfaced paths. Fleischer Propagation Center was



Garden entryway, late 1980s.

Photograph DBG archives

Photograph DBG archives

My favorite memory of the Desert Botanical Garden is:
Walking in the dark, after one of the jazz concerts, and suddenly seeing the
blooming Queen of the Night, lit by a simple light above it. It was breathtaking.
—Zoltan Gelleri and Maria Salapska

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1



Brick by brick, a new surface was added to the Garden's central pathway, 1993.

built, providing much needed facilities for Curator Liz Ecker (Slauson). Visitors now had the amenities necessary to thoroughly enjoy a trip to this wondrous place.

Board member Bill O'Brien and his wife Sada always invited the Board and new Board members to a get-acquainted social event at their home. At this event in 1989 and having had one of Bill's libations, I got up enough nerve to ask Betty Kitchell if she would chair the first Dinner on the Desert to be held at the Garden. Betty graciously agreed, and the rest is history. Dinner on the Desert was now in its proper setting and the event is always sold out.

In addition to the improvements made during this period, there were two other significant projects. With the leadership of John Graham, Desert House was built and opened in 1993. A \$634,000 National Science Foundation grant in 1992 provided funds for a revised path and trail system. Kathleen Sokolofski, Ruth Greenhouse and Pat Smith of the education department were instrumental in securing this grant

and in planning the path and trail system.

None of the accomplishments at the Garden could have occurred without the many dedicated volunteers, staff and Board. Thanks to the leadership of Dr. Breunig and, later, Carolyn O'Malley, the garden has completed most of the improvements envisioned back then. We can all take pride in the current "world class" facilities that allow the Garden to continue to fill its expanding role in our community and the world.

Serving on the board was one of the most educational and enjoyable parts of my life. Becoming acquainted with so many talented staff members, volunteers, and Board members truly enriched my life. Dr. Breunig and Dr. William Huizingh are two amazing friends who helped most to further the education of this native Arizonan.

Dr. Breunig once told a story about visiting the Tohono O'Odham. On this visit he asked one of the elders how they were able to survive there. The Elder said, "We do not survive here. This is our *home*." The Desert

Botanical Garden is a place where everyone can learn to appreciate the intrinsic beauty of this desert we call home. Learning about and appreciating the plants of our desert home enriches all of us. Native Americans have always understood that a reverence for and an understanding of the plants and animals of our desert home are a vital part of life itself.

I miss paying Lynn Trainum—who sold admissions in the old Gift Shop—to enter the Garden, and I shall always remember the courage and dedication of Board member Vikkie Bone, who faithfully attended meetings while suffering from a terminal illness.

One has not truly lived unless one has listened to the birds while walking in the awesome beauty of this magnificent garden, or heard César Mazier singing "Feliz Navidad" on *Luminaria* nights, or listened to hear where in the Garden one could find Mary Irish.



Construction of the Schatt entryway, 2001.

Cliff Douglas, a native Arizonan, is president of Harris Cattle Co., a farming corporation that primarily grows desert trees for the landscape industry under the name of Arid Zone Trees. He was elected to the Garden's board of trustees in 1987 and served as president for 1989-1990.



My favorite memory of the Desert Botanical Garden is:

Thirty years ago in March of 1974 my husband and I visited the garden for the first time. Our three children, ages 5 and 2-year-old twins, were with us. We enjoyed so much that when anyone came to visit we always took them to see the garden. 1974 is also the year we moved to the Valley.

—Patricia and Robert Jenkinson

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

My personal Garden

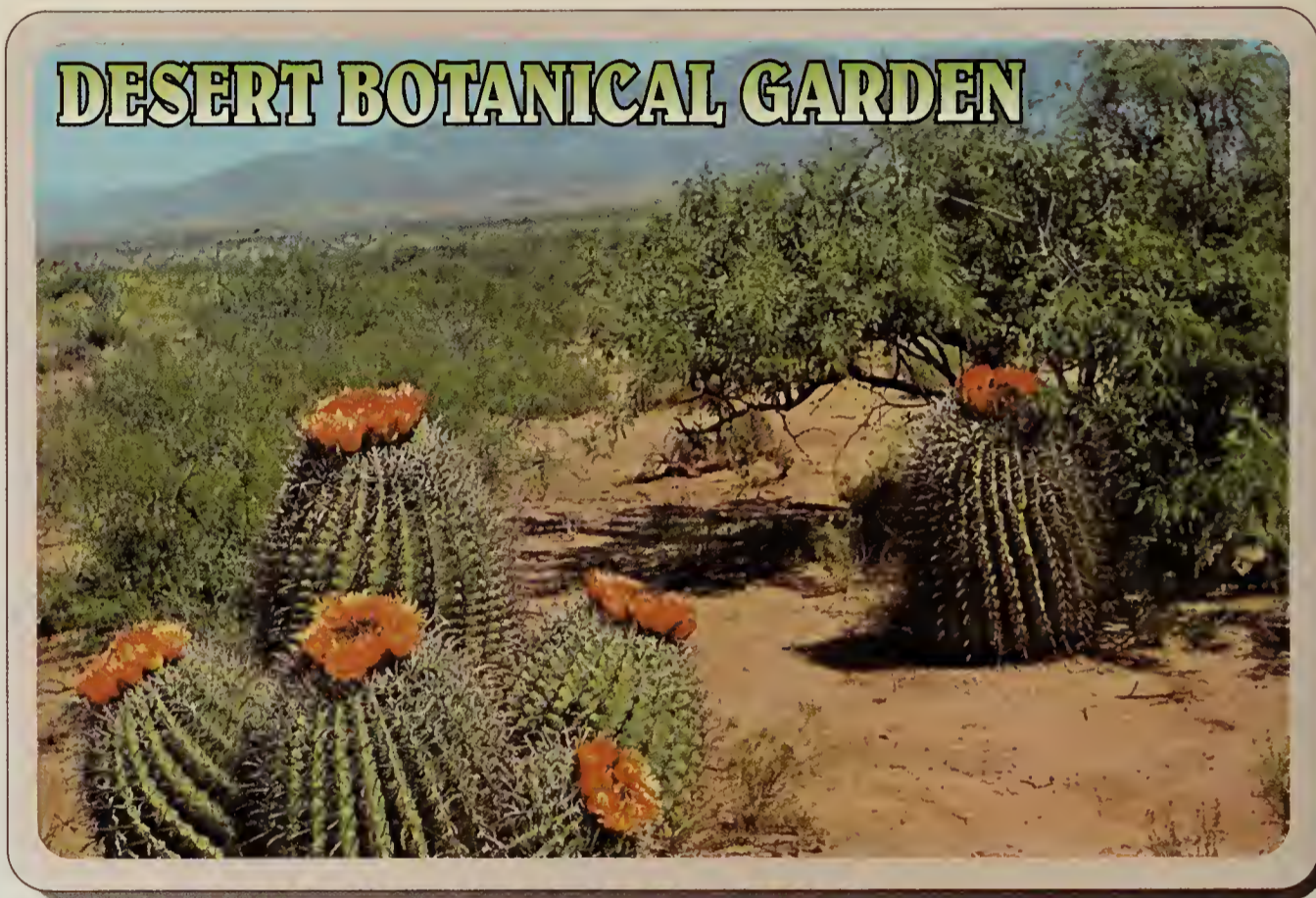
by Sharon J. Proctor, Ph.D.

My parents were R.C. and Claire Meyer Proctor, and we lived in a little, pueblo-style adobe house in Phoenix. Mother and Dad were well known desert photographers. From the mid-1930s to the mid-1960s their cactus pictures appeared in magazines, books, encyclopedias, playing cards, restaurant menus, drapery fabrics, post cards, notepaper, greeting cards, and other products all over North America and Europe.

They had come to Arizona from the East—separately—in the mid '30s. In 1937 they met and married in Phoenix; two years later I was born. Both loved anything related to the desert, but their main interest was cacti. We took frequent trips to the desert to collect specimens for our yard, and they quickly became cactus experts. When I was about six or seven years old, in the mid 1940s, they became closely involved with the Desert Botanical Garden.

The Garden in those years was in the middle of a wild desert. There were no paved roads to it. Getting there involved a bumpy car ride over dusty “washboard” dirt roads with sudden, deep dips into dry washes. From where we lived in Phoenix, we also had to go around the large military reservation (now the National Guard base) that lay to the west of the Garden and covered much of Papago Park. We drove straight east on McDowell Road, to its abrupt dead end at the military chain link fence; then we turned northward along the fence, past row upon row of military tanks, trucks, jeeps and other equipment, then east past a few houses, a cemetery and the German prisoner-of-war camp. Eventually we’d turn up another dirt road that led to the Garden, enter the open gate and park at the front entrance to the Webster Auditorium.

Some of the Garden’s early organizers became family friends, inviting us to dinner in their homes and they coming to ours—



Photograph of barrel cactus by R.C. Proctor.

Garden Director W. Taylor Marshall and his wife Therese, Hubert and Lois Earle, Reg Manning, Charles and Lillian Mieg, and Herbert and Angela Bool. The Marshalls’ home was a small apartment in the Webster Auditorium building, consisting of a living room, one or two bedrooms, a kitchen and bathroom. Today it’s the executive director’s suite. The former living room is now Ken Schutz’s outer office, and a bedroom is his private office. The old kitchen is now a work area. In the 1940s, though, the apartment was a cozy living space. The living room had a pueblo Indian-style fireplace in one corner and was furnished with couch, chairs and a small dining table. You could enter it either from the auditorium or from the outdoors. Mrs. Marshall would cook a typical American meat-and-potatoes dinner and serve us at the dining table. Sometimes, however, we’d eat in the large auditorium, at the long table that still stands by the entrance to the former apartment.

After dinner, Mother, Dad and Mr. Marshall would spend the next few hours in the

living room, discussing the latest cactus acquisitions, future Garden plans, what Lou Ella Archer was up to, new books, special Garden visitors, and related topics. Mr. Marshall was a quiet and rather formal man, but a good listener and conversationalist. Mrs. Marshall tended to remain quiet until the talk turned to family. Then she would update us on their children and grandchildren.

My parents and I attended many a Cactus Society meeting, plant sale and cactus show. Dad wrote articles for the “Saguaroland Bulletin,” and he donated most of the illustrations for Mr. Marshall’s book, *Arizona’s Cactuses*. His most visible activity was the free public talks he presented in the auditorium. He would show beautiful slides of cactus flowers and describe interesting aspects of cactus biology. The public seemed to enjoy these presentations. In fact, many in the audience would come up to talk to him afterwards for half an hour or more. As for me, I’d sit in the audience with Mother. When the lights came

My favorite memory of the Desert Botanical Garden is:

My first Luminaria, in 1986. Everyone on the grounds was asked to light candles. We used candles to light (before the days of butane lighters). I remember watching the bags "come to life" as the sun went down. What a magical time of the evening! I've continued to light for eighteen years and it's still magical! —Jean Besich

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

on again, I'd often get up and head for the glass-covered shelves in the auditorium walls. They contained the most amazing "saguaro shoes" I'd ever seen. I never tired of looking at them.

Naturally my parents and I spent many afternoons walking along the gravel paths and noting which cacti were new additions and which had grown. My own focus was the little swift lizards that skittered about, buzzards circling over the surrounding desert, cactus crests, jackrabbits, roadrunners, boojum trees, and cactus wren nests in chollas.

It wasn't long, though, before I discovered a couple of the Garden's non-botanical features—the Garden cats and the Earle boys. The cats had been brought in to keep wild jackrabbits from eating the plants, and they had the run of the place. The boys were the young sons of Hubert Earle, the gardener and caretaker (years later he became director). They also had the run of the place.

I would excuse myself at some point during an afternoon visit and go in search of cats. This was a real treat, as we had none at home and I loved animals. The Garden felines were mostly tabbies and they tended to stay out of sight during public hours. Some were quite tame, however, and had names, and Mr. Marshall would suggest where I could find them. I'd walk out behind the Webster Auditorium and find one by an old shed or under a car or bench. Sometimes I'd just carry it around the back areas and talk to it. Often, however, I'd sit down and stroke the little fellow until it dissolved into purring ecstasy. The other cats, meanwhile, would emerge from hiding and want similar attention. I always tried to oblige them.

If I were lucky, I'd get to spend time with the Earle boys. John was my age, Art a bit older. Initially they and their parents lived in a trailer parked behind the Webster

A Special Summer Companion

In the 1940s we lived at 1330 East Coronado Road in Phoenix. The neighborhood wasn't built up then, and regal horned lizards (*Phrynosoma solare*) still thrived in the vacant lots and gravel alleys. As a child, I was fascinated by these reptiles. I'd catch them in the alley behind our house in spring, keep them all summer, then release them in fall to hibernate. The following spring I'd go out hunting for them again. Before releasing them I'd put some of Mother's red nail polish on their toenails. My record was one male that I kept for five different summers.

I fed my "horned toads" (as they were called then) red ants, their natural food.

Fortunately there were "ant hills" everywhere. In the late afternoon, when the sun was low in the west, I would walk up and down our alley carrying (1) my cardboard box of horned toads, (2) a second cardboard box with top and bottom removed and (3) Mother's old "enema bulb." The latter was for blowing air into the ant hole, which provoked the ants into coming out. When the right concentration of ants had emerged, I would place the bottomless box over the hole and add the animals. They were well fed all summer.

I kept them in a large cardboard box at home with sterilized sand on the bottom. I had to exercise them, of course; so would often turn them loose in our living

room. One day I had to gather them up because Mother was expecting some women friends. Unfortunately one animal went missing. We looked everywhere, but gave up the search when the company arrived. Sitting in my bedroom later, I heard a scream. A guest had found my missing horned toad — it had climbed up a window drape!

Not surprisingly I went on to become a zoologist — studying first at the University of Arizona, then at Stanford. I live in British Columbia now, but have never forgotten my summer companions of long ago.

—Sharon Proctor

Sharon Proctor with a summer pet, a horned toad, in 1946.



Photograph by R.C. Proctor

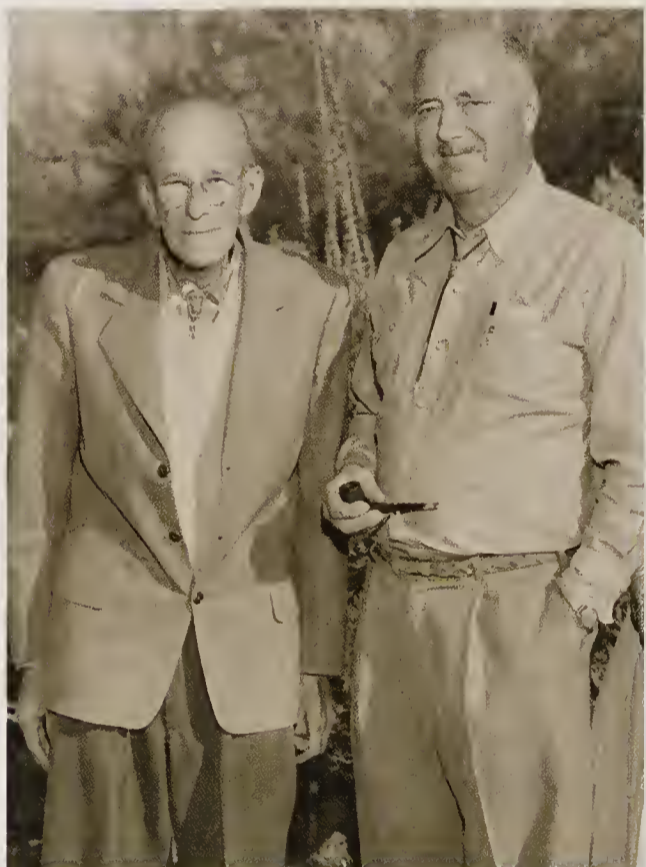


My favorite memory of the Desert Botanical Garden is:

Each Christmas our son's family came to see us. . . Since our granddaughter Chloe was two years old she has loved plants. We took her to the DBG because she loved cactus. She surprised her older cousins by knowing a large number of plant names. Every Christmas Chloe asks us to take her back there. She is now seven years old and still loves plants and knows dozens of plant names. —James K. Wheat

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

Auditorium, out of public sight. Later, in 1952, a small house was built for them in the same general location. (Today it's part of the Archer House). The three of us would walk aimlessly in the desert beyond the Garden, up the nearby hill or around the perimeter of the public areas, throwing the occasional rock or stick, talking about ourselves, school, the latest Garden gossip, the cats and other important things. One day they took me all the way to Governor Hunt's tomb, the white one shaped like a tent that sits on a Papago Park hill.



W. Tyler Marshall (l), Garden Director from 1946-57 with Charles Mieg (r), 1956

By 1950, a phenomenon called "Charlie Mieg" had joined the Garden circle. An avid cactus enthusiast, he was a large blustery man, with a booming voice and a strong physical presence. He had a natural ability to dominate any crowd. He also had a strong sense of humor and a comedian's perfect sense of timing. He'd be talking to a group about a cactus collecting trip or a cactus he'd collected—then instantly undergo a paradigm shift, startling his listeners with a joke about his experience or a funny description of the subject. Wherever he



Entrance to the Garden before construction of Galvin Parkway.

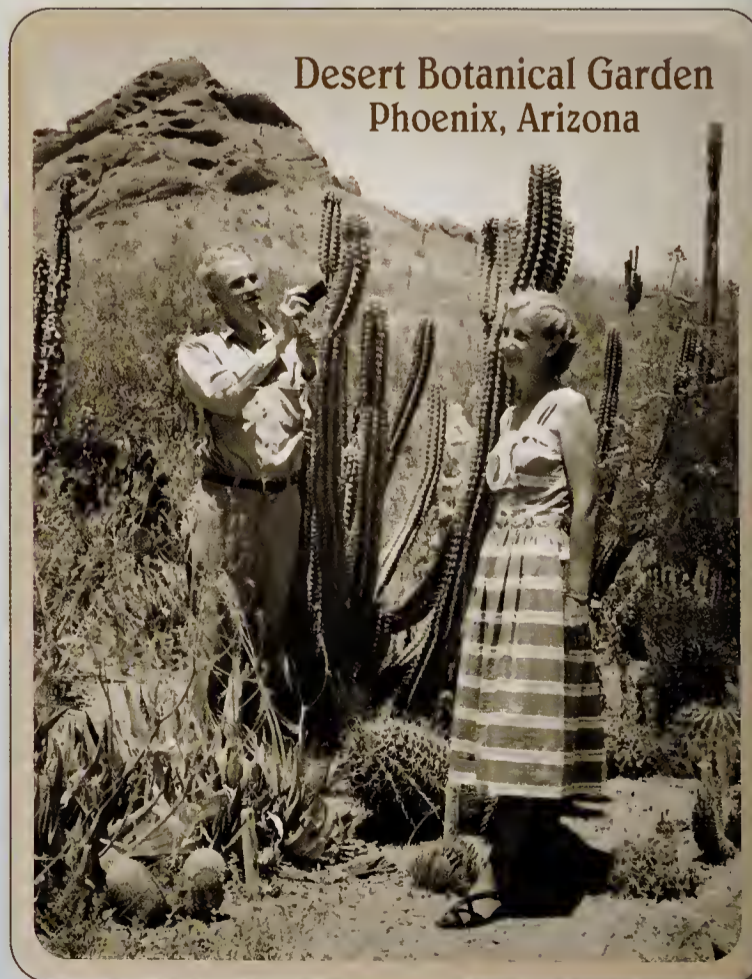
was, people burst into laughter. He was involved in real estate. I remember hearing that he'd bought a worthless mountain near Scottsdale ("Mummy Mountain") against all advice, subdivided it, sold the lots, and made a million dollars.

Charlie Mieg's infectious personality and humorous approach to anything "cactus" livened up our Garden visits considerably. He made cacti both interesting and "fun." Not only did he make humorous comments, but he could tell wonderful stories about his cactus collecting trips and other desert experiences. His talents found full expression in the "Cactomaniacs," a club he organized that met periodically in the Webster Auditorium. My parents and I attended numerous meetings. They featured slide shows (by my father and others), lectures or discussions, preceded and followed by the Mieg humor and audience laughter.

Sometimes, after the last visitor was gone (evening events were rare), I would stand near the Webster Auditorium entrance and watch the brilliant sunset fill the sky. As the last solar ray disappeared, all would become quiet. The moon and stars would appear, casting a ghostly shroud over this little botanical world. Overwhelmed

by a sense of loneliness, I'd head for the coziness of the Marshall apartment for another evening of dinner and listening to adults talk about cacti.

Sharon Proctor was born in Phoenix in 1939. She studied zoology at the University of Arizona and biology at Stanford University and has lived in British Columbia, Canada, since 1964. She and husband David Rodger are science writers and editors.



Photograph of R.C. and Claire Meyer Proctor, c. 1951

My favorite memory of the Desert Botanical Garden is:

...God bless you all. I have wonderful memories of your gardens and often vision them when I need a substitute for pain. I remember the butterflies, the openings of night blooming lilies on delicate cactus, the hummingbirds zooming in incredible speeds. They are all lovely memories. Thank you.

—Mary Ann E. Castens

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

Heat and chicken wire: what was not to love?

By Patrick Quirk, Horticulturist

My first visit to the Garden was on a roasting August afternoon in 1977. Just to the rear of the original gift shop through which visitors entered and exited the Garden—now the development office—was a glass box of the kind used at movie houses for ticket stubs. The Garden used it to collect donations for entry because there was no fee for admission. It contained a few \$1 bills, which appeared to be the going rate, so I added one more. There was also a water fountain of cold water where I loaded up.

One thing struck me immediately as odd. All the plants were encased in rings of chicken wire fencing, ranging in condition from new to rusty. Some plantings of greater density had wire overlapping wire, all to a singularly ugly effect. I could not imagine why this was so, because it was so awful looking. Later I learned that it was to protect the plants from being eaten by rabbits and was really needed.

At that time you could have called it the Desert Botanical Shrubland. Great thickets of shrubs and small trees dominated the landscape, and there was almost no shade except for three mesquite trees in the main arroyo although they shaded none of the paths.

I was really starting to burn up in the heat and sunshine when I espied down a side path a water fountain and so headed that way. Turning the valve, I reached down for a drink and got a face full of very hot water! This was most unexpected and not at all pleasant. Looking for some relief and really becoming fatigued with the heat, I headed for the auditorium, where I thought I could at least find cool air. Again, a surprise—Webster Auditorium had no air conditioning, just some not very efficient swamp boxes and no drinking fountains. I had seen no one since entering the Garden and I wondered if I would. Opening a door, I saw a girl seated behind a desk. She was the most



Webster Auditorium, 1954

excellent Tracy Peterson, receptionist, who directed me to a hidden water fountain on the back patio with REALLY COLD water. I spent some time with that.

Considerably renewed, I determined to see the rest of the place. I went to the shade trees in the main arroyo and rested awhile, and



then went on to the Succulent House, whose plants were certainly interesting, as well as the surrounding agave display. Between this and the Cactus House was a weird, funky little greenhouse that seemingly served no discernable purpose because it was empty. The Cactus House was also interesting but strangely dark, with a solid, metal east wall instead of the lath that covered the other sides of the building. The heat was again making me crazy so it seemed a good time to pay homage to the water fountain back at the gift shop, and then leave. It really was a desert botanical garden.

How was I to know I would wind up on the staff of the Desert Botanical Garden and spend the better part of my working career here? And I have never learned to enjoy the heat.

Patrick Quirk, who joined the Garden horticulture department in 1978 as a gardener, is the curator of cacti.



My favorite memory of the Desert Botanical Garden is:

I sat in the ramada at the top of the trail. . . It was very early in the morning. To my utter delight and almost disbelief, a salmon pink snake slithered in front of me, moving slowly enough for me to observe its markings. It stopped when it was only inches from my feet, and after perhaps a minute, it continued into the vegetation. I repeated my visits up there many times but saw it only once. . . —Nancy J. Blackledge

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

A rare day at the Garden

By Robert Breunig, Ph.D.

It was truly a privilege to be director of the Desert Botanical Garden from 1985 to 1994. For me, the Garden was, and is, the most significant place in all of Phoenix—a place that represents the very soul of this desert city. By its nature the Garden symbolizes the beauty and diversity of the desert. It preserves and honors the character of the desert that once was the landscape of what is now Phoenix and it is a beacon for what Phoenix can become again. Every day at the Garden is a day of visual delight, a kaleidoscope of form, color and light.

One of the most memorable occasions during my tenure at the Desert Botanical

The Dalai Lama in his official Arizona portrait in 1993.



Photograph by Bob Van Luchene

Totem Pole cactus near Webster Auditorium

Garden was the visit of the Dalai Lama in September 1993. We were contacted by the Tibetan leader's representatives who requested that the visit be a private one with no fanfare and no press. We were told that the Dalai Lama not only wanted to enjoy the beauty and serenity of the Garden but also wanted to learn more about plant conservation and, specifically, about the storage of seeds. We were told that he was concerned about the loss of biodiversity in Tibet and especially wanted to tour the Garden's new seed storage laboratory.

When I was informed of the date and time of the Dalai Lama's visit, my heart sank. It was to be the very hour at which I had agreed to give a keynote address at the convention of the Arizona Municipal Water Users Association in downtown Phoenix. This was a commitment that had to be honored. My only hope was that the Dalai Lama would run late and I

could make it back to the Garden in time to spend some time with him.

Fearing that I would miss the opportunity of a lifetime, I entrusted the greeting of "His Holiness" to César Mazier, head of horticulture; Liz Slauson, curator of the living collection; and Karen Enyedy, my wife, who served as my personal representative. I arranged to carry a pager with me to the convention that would notify me of the Dalai Lama's arrival at the Garden. I explained my plight to my audience and gave what may have seemed like a hurried address on desert plants and water conservation. Just as I was finishing, the pager went off. I thanked my audience, leapt from the podium, ran to my car and raced back to the Garden. By the time I arrived, the Dalai Lama and his entourage were about half way to Webster Auditorium on the main Garden path. Karen, Liz and César were

My favorite memory of the Desert Botanical Garden is:

On a Saturday last year while contemplating the beauty of an agave near the aloe bed, I saw the most amazing artist. She was painting an aloe. [I watched] her observe her subject in the most lovely and intense way, and then somehow as if by magic translate that onto the paper. It was a spectacular moment. —Aviva Tirosh

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

carefully explaining the various species of desert plants.

As I walked up to greet the Dalai Lama I found the group stopped at a *Guaiaecum coulteri*, a Sonoran Desert plant related to the creosote bush. The plant had a colorful seed pod which when split open revealed colors of red and saffron gold, like the robes of the Dalai Lama himself. Karen pointed this out—"Buddhist colors!" she exclaimed. The Dalai Lama broke into a hearty and contagious laugh.

Indeed, laughter and expressions of delight at the beauty of the Garden were the hallmarks of this visit. I haven't stopped thinking about this since that day. Here was a man who had experienced unspeakable tragedy in his life and yet he was so full of happiness. He possessed an unusual combination of great intellectual depth and seriousness of purpose and, simultaneously, an almost childlike delight in the beauty of the world around him. What an important lesson for those of us who take everything—including ourselves—much too seriously.

We moved on to Webster Auditorium to meet with the Garden staff that had assembled there. As the Dalai Lama entered the room, he spotted Mary Catellier of the Garden's business office who was then very pregnant. With a wide smile on his face he greeted Mary and gently patted her maternal fullness to bless the child.

In the auditorium Liz Slauson spoke to the Dalai Lama about the biology and techniques of seed conservation. Then the tour of the Garden continued, ending at the seed storage laboratory. As we walked through the Garden, the Dalai Lama delighted in



Webster Auditorium

everything he saw—and he didn't want to leave. His scheduled one-hour visit was stretching into two, creating great concern among his "handlers" who pulled me aside and told me that he was staying too long and asked me to help encourage him to leave. I told them in effect that this was their problem—I wasn't about to ask the Dalai Lama to leave our Garden! All too soon for us, however, he was persuaded that it was time to go, and he was finally whisked away.

I will always remember the experience of that day. We were in the presence of a spiritually powerful yet humble and generous person, and we were touched by him. We all felt that we, the Garden—the soul of our desert city—had been blessed.

Robert Breunig has returned to Arizona, the home state of his heart, this past winter to become director of the Museum of Northern Arizona in Flagstaff.





My favorite memory of the Desert Botanical Garden is:

I'm a Phoenix native and used to visit the Garden often when I was a child. Now as a member of the staff, I have the privilege of being able to bring my children to the Garden anytime they want to. I am grateful that the Garden is still here and that I can share this treasure with them. —Paty Wilson

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

Thirty wonderful years

By Wendy Hodgson, M.S.

One summer day in 1974 Rodney Engard, a gifted botanist who later would become the fifth director of the Desert Botanical Garden, introduced me to Howard Scott Gentry. Dr. Gentry needed an illustrator to finish artwork for his manuscript on the agaves of continental North America. Thus started my thirty years at the Garden, engaged in a field of study—botany—that is not work but a wonderful way of life for me.

Spending so many years intimately associated with the Garden has produced many, many experiences and memories. I remember pedaling to work and spending the day with Gentry, listening to him talk longingly of days past, of travels, friends and agaves in Mexico as he looked out the little window towards Elliot Patio.

During those early years only a dozen people worked at the Garden. In fact, two staff members lived in what is today the director's office suite! As small as our staff was, we still accomplished a great deal. Engard started our *Luminaria* festival in 1978; cookies were made by staff and volunteers, a thousand luminaries illuminated a few paths, and it was free. The cactus show, in conjunction with the Garden's Art Show, both held in Webster, was an especially popular event, drawing crowds of hundreds with cars backed all the way to Van Buren Street.

Monthly botanical field trips for Garden members and non-members to various places in the state provided opportunities for people to learn our state's flora. They also provided me such an opportunity as I, with Russ Haughey and others, led many of these trips. Prior to each trip we did a checkout, collecting and identifying all that we saw. Our field trip lists continue to assist botanists and others in identifying what plants occurred in numerous areas of the state fifteen to twenty-five years ago. Trips ranged from one-day excursions to such

Planting of the Desert Botanical Garden



Photograph DBG archives

Old dependable truck used for salvaging plants for the Garden, 1966.

places as Bumble Bee or the Superstitions to multi-day trips to such places as the Chiricahua Mountains, Organ Pipe Cactus National Monument and Keet Seel. We encouraged car-pooling but transportation was mainly via a rickety yet eerily dependable 1965 Chevy van and other donated vehicles. On one trip we had two flat tires (at once)

but saw sixteen elk and seventy-two species of plants.

Staff engaged in a number of plant collection trips, often to Baja California or salvage sites such as mining operations in Ajo or near Miami. Inevitably our seemingly large number of rescued plants was but a



Photograph DBG archives

A volunteer "work party" folds bags for *Luminaria* in the early 1990s.



My favorite memory of the Desert Botanical Garden is.

The discovery of the healing powers and spirituality of the Garden. Being recently disabled, I've had tremendous difficulty finding my way back to feeling a sense of "ability" within this disability. The greatest relief to chronic pain has been sketching, painting and just "being" in the Garden. —Terri Laird-Newton

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

drop in the bucket, but they were saved plants nonetheless. Once we were able to bring back a huge desert spoon (*Dasyliirion wheeleri*) with the help of the mining company's large crane at the site. During my one-year stint as a horticulturist, I so much enjoyed digging up the weeds with my disk-hoe in the dog days of summer that they labeled me "the Disco Queen."

Over the years I have had the pleasure to work with or meet a number of special people, including the Dalai Lama, who honored us with his presence one day. Volunteers have become close friends, including my dedicated "three amoebas," Audrey Praker and Rene and Herb Rosenberg, who have volunteered for the herbarium/collections for twenty years. A few volunteers, including Joni Ward and Dawn Goldman, having been smitten by the botanical bug, have become fledgling botanists, an extremely gratifying experience to witness.

Being with the Garden has allowed me to visit beautiful places in search of plants from the slot canyons and high temples of the Grand Canyon to the volcanic ash covered lands of Arequipa, Peru. I also traveled to the jungles of Thailand and Burma, where Ted and Adele Anderson and I worked closely with once-feared, former head hunters of the Wa tribe, searching for medicinal plants and information. We were not concerned by our Wa friends, but rather for the oppressive military junta of Burma.

Having been at the Garden for so long a period I have also experienced the sadness of losing many people who have entered my life through the magic of the Garden, some for another place, others for another place and time. But the Garden, like an old friend, remains steadfast and true.

I recently spent an afternoon with a very special friend. She was an active partici-

pant on our early plant identification field trips twenty-six to thirty years ago. Her grandson asked if I would like to help her celebrate her 90th birthday at the Garden, to talk to her about plants along the *Plants and People of the Sonoran Desert Trail* and to share stories about my adventures. I was told that she had remained a member all these years because of those earlier field trips and

the passion and love for the desert that I'd expressed and for what the Garden stands. I hope I "work" at the Garden another thirty years.

Wendy Hodgson, M.S., is senior research botanist at the Garden. She is also an author, botanical illustrator, plant collector, director of the herbarium, and has discovered and named two new species of agave.



Herbarium in 1972

Photograph DBG archives

Boojum Breakfast Tours for New Members

Saturday / April 3 / Choose 8-10 a.m. or 10 a.m.-12 p.m.

Saturday / May 1 / Choose 7-9 a.m. or 9-11 a.m.

Reservations required. Call 480-481-8186.

Executive Director Ken Schutz welcomes new Garden members to this free docent-led tour that features staff presentations in areas of the Garden not usually open to visitors. This free tour for new members includes breakfast and a special Garden Shop discount.



Celebrate the wildflowers

Talks by recognized experts in wildflowers will highlight the second annual **Wildflower Symposium** on Saturday, March 6, 9 a.m. to 3 p.m. Flo Oxley from the Ladybird Johnson Wildflower Center in Austin, Texas; Angela Overy, author of *Sex in Your Garden* and a popular speaker from the Denver Botanic Gardens; and Karen Schedler, local expert from Arizona Game and Fish Department, will speak. The symposium will also offer behind-the-scenes tours of the Garden's wildflower trail, seed vault, and the butterfly pavilion. Registration is limited to 200. Call 480-941-1225 or visit www.dbg.org for fees and registration.



Photograph by Gene Almendinger

A **Wildflower Festival** during the weekend of March 6-7 will spotlight Garden wildflowers with a series of family activities, entertainment and much more. Strolling the wildflower

trail as it comes into full spring beauty will be a highlight. All event activities are free with Garden admission. More information is available by calling 480-941-1225 or log on to www.dbg.org.

Dinner on the Desert

To celebrate Garden history *Dinner on the Desert*, one of the Garden's major fundraisers, will look to the Garden's 65th anniversary and celebrate the vision and commitment of those individuals who have nurtured the institution since it began in 1939, according to Trustee Sue Melton, who is chairing the event.

The event will be held on Saturday, April 24, beginning at 6 p.m. in Dorrance Hall with cocktails, hors d'oeuvres, and a silent auction of unique plant specimens, fine art and garden art. After the auction, guests will stroll the Garden's illuminated walkways to Ullman Terrace and the

traditional culinary pleasure of fine dining under the stars.

Valley radio and television personality Pat McMahon will emcee a live auction following dinner with spectacular items such as an Ed Mell original oil painting, a travel package to Nashville's Country Music Awards, and a private food and wine adventure for twelve guests catered by Executive Chef Jim Palmeri of the Hyatt Resort in Scottsdale.

Table reservations for ten begin at \$3,000 and individual reservations are \$300 each. For additional information and reservations, please call Joyce Melter at 480-481-8147.

Larger Luminaria also a large success

The 26th version of Luminaria Nights, held last December, continued the annual event's long tradition of pleasing holiday crowds and raising money for the Garden with great success.

Conducted for many years under the aegis of the Garden's enthusiastic volunteers, *Las Noches de las Luminarias* was staged this time by the staff—with the help of more than 650 volunteers—and raised \$242,000. The event was expanded to four weekends from the one weekend of past years.

One mishap occurred when a late-night rain deluged the 6,000 luminary bags after the party was over, but staff, Garden members and volunteers sprang to work and reset the whole Garden in four hours in order to be ready for the next day's show. They also made a new set of back-up bags, which were used during the final weekend.

Kayla Kolar, deputy director, sends a "humongous" thanks to all helpers—volunteers, Garden members, and staff—for making the larger event such a success.



Photograph by Charles Cobeen

Music in the Garden Spring Concert Series

Sundays, 12-2 p.m. on Ullman Terrace

- | | |
|----------|--|
| March 7 | Blaise Lantana Quartet — Jazz |
| March 14 | William Eaton Ensemble — World Chamber/Southwest Ambient |
| March 28 | Mex-Sal — Salsa |

Jazz in the Garden Concert Series

Fridays, 7-9 p.m. on Ullman Terrace

- | | |
|----------|--|
| April 2 | Sistah Blue — Blues |
| April 9 | Larry Redhouse Trio — Contemporary Original Jazz |
| April 16 | Novo Mundo — Brazilian Jazz |
| April 30 | Sherry Roberson — Traditional Jazz and Blues |
| May 7 | Turning Point — Contemporary Jazz |
| May 14 | Rocket 88's — Blues |
| May 21 | Sonido Global — Latin Jazz |
| May 28 | Pete Pancrazi — Traditional Jazz |

Concert Tickets:

Members, \$10; non-members, \$16; children 3-12 years, \$8; under 3 are free.

Group rates available. Arcadia Farms' Taste of the Desert serves lunch/dinner for an additional charge. Cash bar available during Jazz series only. General seating only. Limited tickets available - advance ticket purchase recommended. Please call 480-941-1225 or come to the Garden Admissions. No outside food or beverage allowed. NO REFUNDS OR EXCHANGES AFTER TICKET PURCHASE.

Sponsored by: 95.5 KYOT



Photograph by Adam Rodriguez

Butterfly Pavilion

Open for Members: March 12 / 10 a.m.-4 p.m.

Open for Public: March 13-May 9 / 10 a.m.-4 p.m.

Members Free / Non-members \$1.50 - 3 years and older with paid Garden admission

People of all ages enjoy the experience of walking among hundreds of butterflies fluttering about their heads and perching on their shoulders. Watch as new butterflies emerge from their chrysalids in the emergence chamber. The exhibit highlights the beauty and diversity of North America's butterflies.

2nd Annual Agave on the Rocks

Friday / March 26 / 6-10 p.m. / \$50 per person

The evening will come alive as guests stroll through the Garden sampling fabulous food from local caterers and restaurants while sipping on flavorful margaritas. Enjoy sounds from mariachi to marimba, view the Garden's agave collection at night, and learn about tequila.

For tickets and additional information about this fundraiser call 480-941-1225.

Agave Festival

Saturday and Sunday / March 27-28 / 10 a.m.-4 p.m.

Explore the fascinating world of agave plants during this fun-filled weekend. Tours of the agave collection led by expert Garden staff.

Entertainment, family activities and much more.

Pre-register for talk and book-signing by renowned author,

Gary Nabhan on Sunday, March 28, 12-2 p.m.

For information call 480-941-1225.

Spring Plant Sale Festival



March 19, 20 and 21

Members' Preview Friday / 9 a.m. - 5 p.m.

Open to Public Sat. & Sun. / 9 a.m. - 5 p.m.

One-stop-shop of desert-adapted plants and Garden art
Garden Members receive 10% discount on plant purchases.

Visit our website at www.dbg.org



N APPRECIATION

The Sonoran Quarterly | SPRING
March 2004 | Volume 58, No. 1

The Desert Botanical Garden is grateful for the support of all 11,898 members. Recognized here are members of the Founder's Circle, President's Club, Director's Circle, Curator's Circle, Saguaro Society, and The Sonoran Circle. Also listed are donations and memberships received from October 1 to December 15, 2003, for the Ocotillo Club, Boojum Club, Agave Century Club and Desert Council.

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The Desert Botanical Garden is honored to acknowledge the following individuals who have included the Garden in their estate plans.
Anonymous (17)
Anonymous DBG Docent
Gail and John Allan
Sidney Allen
Gene Almendinger
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65 YEARS



Photograph DBG archives

Calendar of Special Events

John Henry Waddell Sculpture Exhibit

January 18–June 27

Wildflower Symposium: All About Wildflowers

Saturday, March 6 • 9 a.m.-3 p.m. • \$25 members, \$30 non-members

Call 480-941-1225 to register.

Wildflower Festival

Saturday and Sunday, March 6–7 • 10 a.m.-4 p.m.

Butterfly Pavilion

Open for members: Friday, March 12 • 10 a.m.-4 p.m. • Open to the public: March 13–May 9 • 10 a.m.-4 p.m.
free to members; \$1.50 non-members 3 years and older with paid Garden admission.

Spring Plant Sale Festival

Members' preview: Friday, March 19 • 9 a.m.-5 p.m. • Open to the public: Saturday & Sunday, March 20-21 • 9 a.m.-5 p.m.

2nd Annual Agave on the Rocks

Friday, March 26 • 6 - 10 p.m.

Call 480-941-1225 for tickets to this fundraising event.

Agave Festival

Saturday & Sunday, March 27 – 28 • 10 a.m. - 4 p.m. • Event activities included with admission

Cactus & Succulent Show

Friday–Sunday, April 16 - 18

Dinner on the Desert

Saturday, April 24 • 6 p.m.

Call 480-481-8147 for information and reservations.

Mothers' Day Lunch and Concert with Estéban

Sunday, May 9 • Two shows available. Call 480-941-1225 for more details.

Annual Members' Meeting

Thursday, May 20 • 5–7 p.m.

Music in the Garden Spring Concert Series

March 7, 14, and 28 • 12 to 2 p.m.

Jazz in the Garden Concert Series

Fridays, April 2 through May 28 • 7–9 p.m.



The Sonoran Quarterly

Desert Botanical Garden

1201 N. Galvin Parkway

Phoenix, AZ 85008

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The mission of the Desert Botanical Garden:

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.

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Desert Botanical Garden

THE SONORAN QUARTERLY

The bulletin for members and friends of the Desert Botanical Garden, Phoenix, Arizona June 2004/Volume 58, No. 2



ANNUAL REPORT INSIDE

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THE SONORAN QUARTERLY

June 2004

VOLUME 58, NO. 2

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World
Class

Succulent plants are found the world over, and so are the Garden's staff and its reputation for excellence in collecting and displaying arid land plants. Throughout March, Raul Puente, the Garden's curator of the Living Collection, joined an expedition to the Atacama Desert and the Andes Mountains in northern Chile, where he logged more than six thousand miles and collected twenty-six living cactus specimens, fifty-five species of cacti seeds, and sixty-four new herbarium specimens. Raul returned to the Garden in early April and his specimens followed several days later after rigorous, but successful, inspections by the United States Department of Agriculture.

Raul also has been awarded a highly competitive grant from the International Partnerships Among Museums program managed by the American Association of Museums. Later this year he will visit the Botswana National Botanical Garden in southern Africa to gather ethnobotanical information and to collect seeds of trees, shrubs, and succulents indigenous to the Kalahari Desert. As part of that same grant, a staff member from the garden in Botswana will visit our Garden in the spring of 2005. Nonfo Mosesane will use his time



Maihueiopsis atacamensis in habitat near Volcan San Pedro, Chile.

Photograph by Raul Puente



Photograph by Adam Rodriguez

Kenneth J. Schutz

here to collect seeds and herbarium specimens of plants indigenous to the Sonoran Desert, and also to learn curatorial procedures involving data basing, mapping, and processing herbarium specimens.

International visitors frequently visit us. This spring I hosted in Desert House two colleagues from our sister garden, Parque Ecológico Cubitos, in Pachuca, Mexico.

Visiting were Raul Padilla, director of communications and Mireya Garcia, assistant director of education for the Cubitos Garden. Mireya spent two weeks here comparing notes and sharing ideas with our education staff, and Raul spent an entire month filming, editing, and producing a promotional video about our institution.



Raul Padilla, director of communication at Cubitos Garden videotaping desert blooms.

Photograph by Renee Immel

Two of our staff members—Elaine McGinn, director of exhibits, and Eric Garton, public programs coordinator—spent five days in the Mexican State of Michoacán this spring following the migration of eastern Monarch butterflies, which over-winter in the high mountain forests near Toluca. Their trip, which was enormously productive, was to scout for a Monarch butterfly expedition that the Garden will sponsor next spring.

And, finally, I will be doing some international traveling myself. Thanks to the Virginia G. Piper Charitable Trust—specifically, the Piper Fellows Program—I will be taking a two-month sabbatical

this summer. Using support provided by the Trust, I will be moving to the Mexican city of Cuernavaca to enroll in a Spanish language immersion program for eight weeks. My plan is to become fluent in the Spanish language and culturally competent in my understanding of Mexican society. Both of these skills will help me lead our Garden during this exciting time of increasing diversity in our community.



Photograph by Eric Garton

Elaine McGinn, director of exhibits, overlooking the tiny village of Angangueo, Michoacán, Mexico.

During my absence, the acting director of the Garden will be Dr. William Huizingh, my mentor and friend. Dr. Huizingh became a *Trustee emeritus* in May this year, after more than fourteen years of service on the Garden's board of trustees, including a year as president of the board. He also



Photograph by Elaine McGinn

Monarchs basking in the Chincua Butterfly Sanctuary.

served as the Garden's interim director in 2000-2001, after Carolyn O'Malley left and before I arrived. Whenever Dr. Huizingh is at the helm, the Garden couldn't be in better hands. ☀

Ken Schutz

The Dr. William Huizingh Executive Director



CONTENTS

The Sonoran Quarterly SUMMER
June 2004 Volume 58, No. 2

ARTICLES

- Sights and delights of the summer desert garden **4**
- Plants & People of the Sonoran Desert Trail:* **7**
renovations
- ANNUAL REPORT for 2003 **9**
Report to the members
Financial summaries
The Garden by the numbers
- Where else would I be? **14**

FEATURES

- Desert Journal: World Class by Ken Schutz **2**
- Someone to Know: MaryLynn Mack **13**
- Garden News **16**
Ruthie Carll heads education department
Garden attendance soars
John Sallot joins Garden staff
Mesquite bean collection time
Desert Landscaper School certification program
- In Appreciation **18**

ON OUR COVER

Cover photo of *Ferocactus wislizeni* or Fishhook Barrel Cactus blooms from late summer to fall. The ripe fruit are eaten by birds, deer and javelina. Like the Compass Barrel it leans to the southwest.

Photograph by Adam Rodriguez

Oops!

The March issue of The Sonoran Quarterly boasted inaccurately that the Garden's library contains sixty-five thousand volumes. It should have boasted that the library contains more than sixty-five hundred volumes. Also, a photo caption was incorrect. It should read W. Taylor Marshall.

Sights and delights of summer in the desert garden

By Nancy Cutler

*Hot town, summer in the city,
Back of my neck gettin' dirty and gritty.
Been down, isn't it a pity?
Doesn't seem to be a shadow in the city.
All around, people looking half dead,
Walking on a sidewalk hotter than a
match head. . .*

Summer in Phoenix always brings this song, "Summer in the City" by the Lovin' Spoonful, to mind. It seems so true—in the city.

Away from the city, summer in the desert can seem even more forbidding, like a hot, dry land of prickly plants and animals. If you look closely, however, and if you know where to look, summer in the desert is truly fascinating and amazing.

The best times are the evening and the early morning. As the sun goes down, the air is still warm but not intense and, as a visitor said, "it envelopes you like a warm blanket." Early mornings are fresh and newly hopeful. Venturing out in the evening or the cool mornings is so pleasant, and oh! the things you can discover!

Dusk is an awe-inspiring time in the desert. Many of the animals that have secreted themselves away during the heat of the day now silently appear in search of food or a mate. A walk in the Desert Botanical Garden where desert plants and animals live in natural harmony proves a safe environment to observe these fascinating events.

At sunset the nighthawks (dove-sized birds) swoop silently and gracefully over the treetops scooping up flying

insects for their evening meal. You have to be alert to notice them in the darkening sky. The daytime birds—gila woodpeckers and doves—flit back and forth through the sky as if finishing last minute projects before settling in safe places for the night. Patches, the resident desert tortoise, waddles out from her summer den beneath a huge prickly-pear in search of some green leafy plants or a prickly-pear fruit for her supper salad. (She is a vegan). She plods along deliberately and is rarely distracted from her quest. What a rare treat to spot her on her evening walk.

An evening inspection of a cholla cactus flower reveals tiny solitary bees using these flowers as overnight campsites. They are nestled, one or two, in the bottom of each flower and they are sound asleep. When the first rays of daylight appear, the bees will awaken and fly off to begin their daily routines.

As darkness covers the desert and the air cools a little more, huge, pale cactus flowers make their elegant appearance,

opening slowly through the night, emitting a sweet smell to attract a moth to drink their nectar. Their pale color reflects the moonlight, turning themselves into spotlights as their intense fragrance wafts out into the night air. A lucky spectator might actually see a large sphinx moth—nearly the size of a small hummingbird—flitting around a cactus or agave flower as it drinks nectar.

Another amazing nighttime step stopper is the beautiful yellow and black kingsnake when it ventures out under the cover of darkness. These gentle snakes are looking for an evening meal, usually a rodent. They do, however, also consume rattlesnakes. Kingsnakes are shy and usually avoid visitors. I once observed one slipping along under a creosote bush and into a ground squirrel burrow where, I assume, he was hoping to find a sleeping meal. Before the tail of the snake disappeared into the hole, however, the head emerged from another hole on the other side of the bush. The kingsnake had not been successful in his quest.

It was remarkable to see each of his ends on opposite sides of the bush.

At twilight you might notice a change in the way the air feels. There is a slight increase of humidity in the cooler air, carrying smells more easily. Nocturnal insects and plants depend

Gila woodpecker bringing food to its young.



Photograph by Adam Rodriguez

Photograph by Mike Hennessey



Cactus flower (*Echinopsis thelegona*) blooms at night during the summer.

upon this feature of nature, especially in the desert. Cactus flowers bloom in the cool of the night because they are open windows for water loss through evaporation. Less precious moisture is lost at night, when the air is cooler and slightly more humid.

The quantity and variety of cactus flowers that open in an evening is astounding. Most bloom in June and July and that is not by accident. These flowers bloom predominantly in June or July so that the seeds they produce are ready to germinate just as the monsoon rains arrive in August. This is not only perfect timing, but is essential for the continuance of the species.

Many agaves (century plants) also bloom at night, presenting their fragrant flowers to moths or bats upon high candelabra stalks. We can observe agave flowers as they bloom nightly, but each for only one night, in a graceful sequence from the bottom of the stalk to the top over several sequential nights. This improves the chances that a pollinator will drink some nectar and spread some pollen from flower to flower.

May and June are the "dry summer" months in the Sonoran Desert. There has

been no rain for several months. The weather is hot, the air is dry, and plants and animals are challenged to find food and moisture for survival. We call it a "dry heat" but there is little relief from it.

July and August are considered "wet summer" in the Sonoran Desert as drenching monsoon rains can occur from violent storms that bring much needed moisture to the Sonoran Desert. "Monsoon" is an Arabic word meaning "a change in the wind direction." The wind patterns change from blowing from the northwest to blowing from the southeast and bring with them moisture from the Gulf of Mexico. These rains occur when water is most needed by the plants, animals, and people. In some native cultures the new year begins with the monsoon season when the life-giving rains sprout seeds of crops, cactus, palo verde and mesquite, and renew life from the parched "dry

summer." Wet summer brings its own natural activities to discover, such as the eerie nighttime bleating of toads at the pond as they emerge from the moist mud seeking a mate.

Early morning in the Desert Botanical Garden reveals another set of sights and delights. Perhaps a cactus flower is still open from its evening performance. It's a spectacular surprise to turn the corner one early morning and see this elegant show of fragrant beauty.

The white winged doves throw out their distinctive morning call as they fly off to gather mouthfuls of saguaro fruit to feed their babies. These birds are a reverse of our northern "snow bird" tourists to Arizona. They summer here, in this northern part of the Sonoran Desert, traveling north in springtime from Mexico with the blooming of saguaro flowers and staying through the summer to raise their young on the juicy saguaro fruits. As these birds feed their young, they drop seeds and



Photograph by Adam Rodriguez

Visitors spot a toad during a summer flashlight tour.



Photograph by DBG

Harvesting saguaro fruit.

thereby incidentally plant saguaro cactus under the trees where these baby saguaros will get a sheltered start on life. If you look at an aged palo verde or ironwood tree in the desert you will likely see a stately saguaro cactus growing up through the middle of the tree, probably planted by a bird, such as a white wing dove, dropping seeds while feeding its young. You may also observe mesquite flowers with their tiny beans forming on the flower stem after each tiny flower has been pollinated. Day by day the beans grow until they reach full size. They are ripe when they are crisp and dry, just in time for the monsoon rains. Mesquite trees full of ripe beans can only be seen in the hot summer. These beans are a favorite staple food

for many desert animals as well as ancient desert peoples, because they grow so reliably year after year. Today mesquite is a specialty food offered in some restaurants and gift shops.

Saguaro cacti fruit are also abundant in the "dry summer." The delicious fruit is harvested when ripe, around the end of June and early July and again, just in time for the monsoon rains. This juicy fruit is a favorite of most animals in the desert, and is a great treat for people as well. Collecting and tasting a ripe saguaro fruit is a memorable experience. Using a long pole made from two or three woody ribs of the

saguaro cactus, we can reach to the top of most saguaros where the fruit resides. The short, cross piece of wood attached to the top of the pole is used to hook a ripe fruit in the cluster at the top of the cactus and pull it loose from its snug perch. This process looks easy, but is a skill that takes practice. The ripe fruit

is red, sweet, and full of tiny black seeds that resemble poppy seeds, and what a treat to taste!

For most residents in Arizona "summer in the city" means enduring the long season of summer heat, going from air conditioned buildings to air conditioned cars and back, or escaping to cooler climes to visit nature. We rarely consider venturing out into our own desert in summer to visit Nature. DBG volunteers have their own favorite reasons for loving to be in the Garden in the summer:

"The desert is beautiful at night, and has so much activity."

"We get to see night-blooming cacti and hear the sounds of night in the desert."

"It is worth dealing with some discomfort of the heat to see some of these surprising desert events!"

"Some of the things I have seen leave me speechless and it is impossible to describe what you feel."

"It is like great music."

"I even appreciate a warm morning breeze."

"My favorite view is just at sunset. The sky has turned a brilliant mix of orange, red and pink. The (sight of) saguaro and trees and Papago Butte silhouetted against that brilliant sky is breathtaking. The view is as good as any I have seen at the Grand Canyon or along the Pacific Coastline."

As the Lovin' Spoonful sang,
*But after dark it's a different world,
And... despite the heat it'll be alright!
In the summer in the city, in the
summer... [in the desert]* *

Nancy Cutler is the interpretive coordinator at the Desert Botanical Garden.



Photograph by DBG

Fresh saguaro fruit ready to eat.

The Plants and People of the Sonoran Desert Trail: Being renewed and readied for the future

By Elaine McGinn

Renovations began this past January to the *Plants and People of the Sonoran Desert Trail* which opened in 1988. The trail was designed to help modern people learn more about how native peoples have used the plants of the Sonoran Desert for food, construction, medicine, and other purposes.

More than two million people, including 250,000 students, have visited the trail in the past fifteen years to learn how plants have sustained desert peoples for more than ten thousand years.

While the trail's concepts and themes remain relevant, the trail's signs and infrastructure now need major upgrades. Volunteers in the Garden dedicated proceeds from *Las Noches de las Luminarias 2001* to support the renovation. A generous bequest from Alice Feffer, longtime friend and Garden supporter, will be used to create a medicinal exhibit on the trail.

Plans for the renovations began in 1998. A team of Garden staff has reviewed evaluations of the trail and developed improvements that meet museum standards of excellence in both exhibit design and education. The trail renovations will:

- Revise and update the signs, trail guide, and teaching and training material.
- Incorporate the new medicinal exhibit.
- Upgrade infrastructure, including the condition of the trail, benches, pull-offs, seating areas, irrigation, and the collection of plants.
- Evaluate the interpretive focus of the trail and develop new interpretive exhibits with innovative and interactive displays.

Already under way are irrigation improvements, path realignments, development of the medicinal exhibit, design for new benches and seating areas, design for new sign holders, and acquisition and documentation of the ethnobotanical plants on the trail. Later this spring the Apache household area will be moved closer to the agave roasting pit in order to strengthen the interpretive connection of agaves with native cultures. The first three goals of the plan—the signage upgrade, the medicinal exhibit, and the trail infrastructure—are expected to be completed by late fall 2004.

These renovations are only the first phase of a comprehensive plan to improve the *Plants and People of the Sonoran*



Agave Rope sign

Photograph by Elaine McGinn

Desert Trail. In its commitment to present engaging experiences for visitors, the Garden team is studying how to strengthen the exhibits and refine the themes that connect plants and cultures. The exhibits team wants visitors to learn not only about past human relationships with the environment and folk traditions of plant management and use, but also about contemporary attitudes and practices relating to life in the desert. The exhibit will challenge visitors to think about future relationships between plants, people and desert habitats.

The Garden's experience with this exhibit and the recommendations made by staff, volunteers, and various experts will be applied to the development of new exhibits and interpretive formats on the Trail.

Some exhibit ideas are already in the development stage:

Introduction Area: Sonoran Portal Exhibit

A more engaging and interactive entry into the Trail will set the stage for the overall theme of how plants are important, and how cultures in our history have shaped the land over time.

Apache Wickiup in Chaparral habitat.



Photograph by Renee Immel

Plant Pods

Plant Pods will be placed along the Trail where people can touch and use plant materials to learn about the unique habitats of the Sonoran Desert and the principal plants people used for food and technologies.

New Interpretive Formats

New formats will bring the voices of modern day Native Americans from the Phoenix region (Tohono O'odham, Pima-Maricopa, and San Carlos Apache tribes) to tell the stories of how they relate to Sonoran Desert plants past and present.

New and Expanded Exhibits on Hispanic Cultural Influences

What are the rich botanical contributions from Hispanic culture we enjoy in the Southwest today? How do we live *Sonorensis* (a unique blend of Spanish, Mexican, Native American, and European lifestyle) today? How will Latino culture shape the political and cultural landscape of the Sonoran Desert region in the future? Audio recordings and visual documentation will be integrated into exhibits.

Interpretive Activities and Materials

Trailside challenge games and focused activities that foster independent investigation and create a lively exchange of ideas



Edible plants and seeds harvested from the *Plants and People of the Sonoran Desert Trail*.

Photograph by Elaine McGinn

will guide visitors to answer questions such as: what do plants do in the environment and how have cultures related to them? Specially designed tours; Discovery Station interpretation (by Garden Guides); K-12 curricula, workshops, and web site resources will expand the Trail's usefulness to varied audiences.

Additional funding is needed for planning with experts, testing with our audience,



Kevin Smith, garden horticulturist, watching over annual Agave roast.

Photograph by Renee Immel

and building the new formats. A grant from the Arizona Humanities Council received last fall has already started this planning process by allowing us to meet with experts in the fields of history, anthropology, archaeology, and story-telling to ensure that new interpretations, trail design, and historical knowledge are correctly conveyed.

It may take us a couple of years to accomplish all we want to on the *Plants and People of the Sonoran Desert Trail*, but the final outcome will be a trail that will give visitors a rare opportunity to examine their own relationship to the natural world through the window of ethnobotany. 🌵

Elaine McGinn is the Garden's director of exhibits.



Photograph by K. Ann Redinger

DESERT BOTANICAL GARDEN ANNUAL REPORT 2003

A REPORT TO THE MEMBERS: THE GARDEN IN THE YEAR 2003

The year 2003 was a successful one at the Garden, characterized by strong gains in our horticulture, research, education and membership programs, coupled with exciting exhibits and a solid rate of growth in attendance, especially by local audiences.

Spring attendance created a momentum that carried us throughout the year. January 2003 started strong and remained so throughout the season. Arizona's delightful spring weather attracts visitors from around the world. Our Garden welcomed nearly 70,000 out-of-town tourists from January through May, about the same as the year before. Visitation by local residents, however, increased an impressive 30 percent compared to the same five-month period a year ago. Most exciting of all, with the previous year's growth, local attendance at the Garden has more than doubled since 2001.

The strong attendance growth in the spring of 2003 was largely fueled by the new facilities built by the Garden's \$17 million capital campaign: the wildflower trail; the entrance and exit plazas for visitors (and the six thousand new plants adorning them); expanded parking and other visitor amenities; and four world-class buildings devoted to education, research, horticulture, and the Garden's renowned volunteer program. Visitors were also attracted by the Garden's on-going marketing efforts and special exhibits, such as the butterfly pavilion and sculpture displays.

Fall attendance in 2003 was also strong, thanks to the various New World Harvest festivals. The *Las Noches de las Luminarias* celebration in December attracted twice as many guests as in the previous year.

Key departments expanded their programs and effectiveness. The Garden's research, horticulture, and education departments each welcomed a new director in 2003, and the individual departments made great strides in their individual and collective pursuits in support of the Garden's mission.

Dr. Joe McAuliffe, who has been with the Garden since 1990, was appointed director of research in 2003 and has created a comprehensive five-year research plan for the

institution. The first step in that plan was to hire a new cactus scientist to fill the void created when the Garden's previous cactus researcher, Dr. Ted Anderson, passed away. The search for our new cactus scientist is complete, and Dr. Charles Butterworth will join our research department in autumn 2004.

Cathy Babcock, who joined the Garden staff in 1989, was appointed director of horticulture in 2003. The department's many programs have continued to grow and flourish under her leadership. Chief among these are: the Desert Landscaper School (managed and taught exclusively by the staff of the Horticulture department); the on-going program for planting, propagating, nurturing, and pruning the more than fifty thousand plants that comprise the Garden's living collection; and the design of new plant exhibits and seasonal displays that will come on-line during the next several years.

Ruthie Carll, who joined the Garden in 1995, was appointed director of education in 2003. She is focusing the department's efforts in two areas—programs for teachers and students in grades K through 12, and "Life Long Learning" opportunities for the Garden's other patrons who are not in school. Many exciting initiatives have occurred since she took the helm, including: increasing the Garden's guided tour program for school students from two to five days a week; initiating new "day-tripping" hikes and desert discovery opportunities for Garden members, and working with the leadership of the Garden's volunteer program to expand that incredibly important and successful program.

The Garden's operations and finances continue to thrive. The following report from the Treasurer of the Garden's Board of Trustees shows that the institution's financial position remains sound, and that the Garden's resources are managed both conservatively and effectively.

William Wilder
President, Board of Trustees

Ken Schutz
The Dr. William Huizingh Executive Director



Desert
Botanical
Garden

FINANCIAL STATEMENTS

INFORMATION AS OF SEPTEMBER 30, 2003

Fiscal year 2002-2003 was another very successful one for the Desert Botanical Garden. The initiation of the New World Harvest series in the fall, another successful *Luminaria* season, and mild spring weather coupled with the resultant wildflower bloom all combined to create strong visitation and attendance revenue throughout the year.

As the related statements show, admissions revenue increased 21 percent compared to the previous year. This growth in visitation also fueled a 16 percent increase in retail sales, and a 13 percent increase in membership income. Fundraising and special event revenues likewise showed an impressive gain, 17 percent over the previous year. Overall, revenues were up 15 percent as compared to last year.

Readers should note that expenses for fiscal year 2002-2003 were also considerably higher than in the previous year. The large increases reflected in the accompanying statements include \$969,692 in depreciation expense (spread across all categories) related to the \$17 million in new buildings and other facilities that the Garden brought on line in the spring of 2002. This is the first year that the full effect of our new buildings has been reflected in the Garden's financial statements, and similar amounts will be recognized over each of the next fourteen years. Excluding this non-cash \$969,692 depreciation cost, total Garden expenses increased six percent last year, compared to the 15 percent increase in revenues.

The Garden's balance sheet also remained strong throughout the year. Cash, Investments, and other current assets are at healthy levels, especially compared to the low level of current liabilities. Longterm liabilities include \$16,300,000 in construction bonds, with longterm investments more than adequate to retire that debt when the bonds come due in 2035. The year-end change in net assets on the balance sheet reflects the substantial depreciation expenses discussed above.

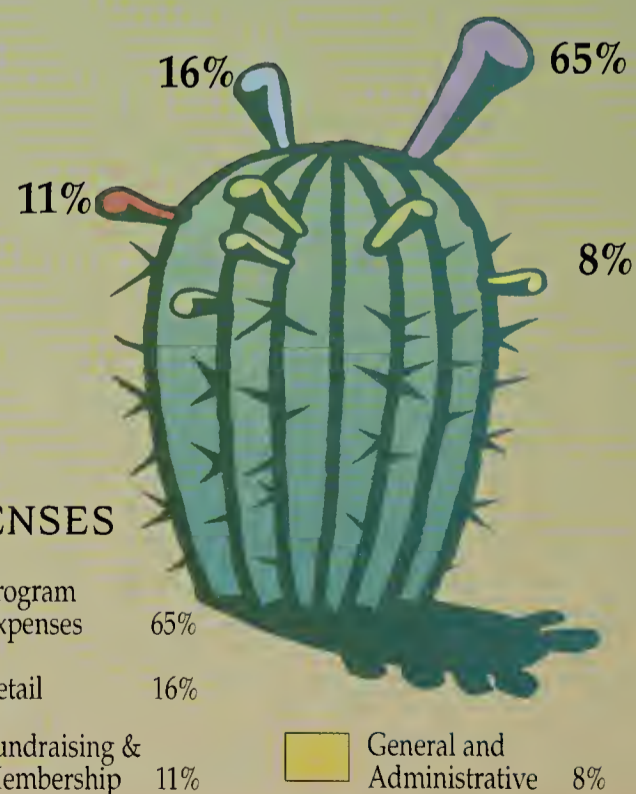
All in all, it was a very good year for the Garden's finances.

James D. Kitchel
Treasurer, Board of Trustees

STATEMENT OF ACTIVITIES

Revenue	2003	2002
Gross Profit on Retail Sales	\$ 959,035	\$ 827,559
Admissions	\$ 1,163,410	\$ 963,927
Contributions, Grants & Special Events	\$1,631,707	\$1,388,499
Investment Income (net)	\$ 337,797	\$ 367,867
Memberships	\$ 834,939	\$ 739,122
Other Revenue	\$ 491,522	\$ 422,260
Total Revenue	\$5,418,410	\$4,709,234

Expenses	2003	2002
Program Expenses	\$ 4,314,351	\$3,709,448
Fundraising & Membership	\$ 734,943	\$ 656,798
General & Administrative	\$ 567,894	\$ 540,002
Retail & Visitor Services	\$ 1,092,569	\$ 483,279
Total Expenses	\$ 6,709,757	\$5,389,527
Change in Net Assets	<u>\$(1,291,347)</u>	<u>\$(680,293)</u>

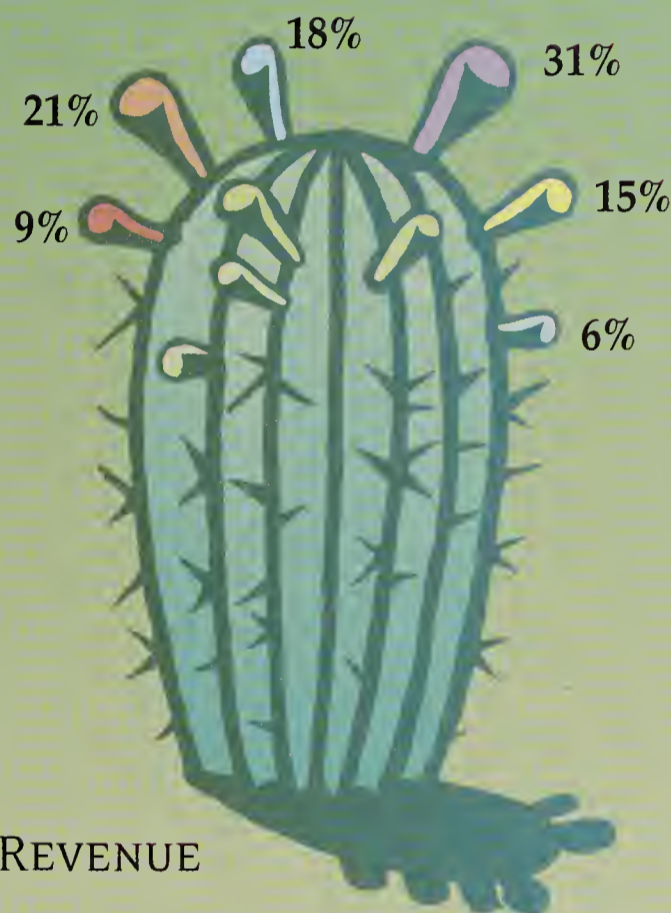




Photograph by John Rodriguez

STATEMENT OF FINANCIAL POSITION

Assets	2003	2002
Cash & Investments	\$ 3,702,340	\$ 6,953,754
Pledges & Other Receivables	\$ 1,382,197	\$ 1,965,544
Inventories	\$ 193,913	\$ 107,258
Total Current Assets	\$ 5,278,450	\$ 9,026,556
Cash & Investments	\$ 10,281,961	\$ 6,555,521
Pledges Receivable	\$ 585,943	\$ 1,316,917
Property & Equipment	\$17,125,016	\$17,567,304
Bond Issuance Cost	\$ 218,887	\$ 225,948
Other Assets	\$ 138,223	\$ 117,114
Total Noncurrent Assets	\$28,350,030	\$25,782,804
Total Assets	\$33,628,480	\$34,809,360
Liabilities		
Accounts Payable	\$ 237,806	\$ 153,395
Accrued Expenses	\$ 203,954	\$ 172,479
Deferred Revenues	\$ 249,388	\$ 245,649
Accrued Interest	\$ 55,117	\$ 64,325
Total Current Liabilities	\$ 746,215	\$ 635,748
Bonds Payable	\$16,300,000	\$16,300,000
Total Liabilities	\$17,046,215	\$16,935,748
Total Net Assets	\$16,582,265	\$17,873,612
Total Liabilities & Net Assets	\$33,628,480	\$34,809,360



REVENUE

Contributions, grants and special events	31%	Memberships	15%
Admissions	21%	Other revenues	9%
Gross Profit on Retail Sales	18%	Investment Income	6%

Auditor's Opinion

The Garden has received an unqualified opinion from its auditors, Miller Wagner & Company, PLLC Certified Public Accountants, on the audit of its financial statements for year ending September 30, 2003. A summary of the financial statements is provided here. Copies of the audited financial statements are available upon request from the Desert Botanical Garden business office at 480-481-8155.

THE MISSION OF THE DESERT BOTANICAL GARDEN:

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



THE GARDEN BY THE NUMBERS

FOR CALENDAR YEAR 2003

VISITORS

Total yearly attendance: 283,992

LIVING COLLECTION

New plant accessions: 401

Total living accessions: 11,842

Total living plants: 21,247, of which 3,096 are seeds

New species added: 22

Total plant species: 3,548

Total taxa (includes varieties, subspecies, formas): 3,986

RARE AND ENDANGERED

Total accessioned seeds and plants: 1,050

Total CPC species: 38

HERBARIUM

New herbarium accessions: 2,165

Total herbarium specimens: 51,973

LIBRARY

Number of books: 6,570

Number of botanical prints: 600

Number of journal and newsletter titles: 335

VOLUNTEERS

Total number of volunteers: 1,180

Total volunteer hours: 59,678

Volunteers working 100 hours or more: 226

Hour Awards accumulated over the total length of service:

•1,000 hours: 12 •2,000 hours: 14 •3,000 hours: 11

•4,000 hours: 3 •5,000 hours: 1 •6,000 hours: 1

•9,000 hours: 2 •10,000 hours: 1

•Hardy Perennial volunteers (ten years of service): 128

Number of core volunteers: 575

Number of new core volunteers: 125

Number of Garden Shop volunteers: 30

Number of horticultural volunteers: 88

Number of interpreter volunteers: 136

Number of membership/envoy volunteers: 38

Number of research/collections volunteers: 16

Number of community volunteers: 603

Number of volunteers in other programs: 267

TOURS AND EDUCATION

Docent interactions: 118,653

Participants in tours: 18,263

Discovery stations: 65,246

Floating interpretation encounters: 35,144

Number of workshops: 136

Participants in workshops: 2,055

Student (K-college) trips to the garden: 32,496

Number of students who received *Desert Fruits and Seeds*: 70,000

Number of students who received *Sonoran Seasons*: 60,000

Number of teachers attending workshops: 167

Number of teachers attending receptions and annual Open House: 493

HORTICULTURE

Total acres at Desert Botanical Garden: 145

Acres under cultivation: 50 – 60

Number of plants in horticulture: 50,000

Number of plants planted in 2003: approximately 1,000

Number of graduates of the Desert Landscaper School in 2003: 99

Total number of Desert Landscaper School graduates: 531

Number of calls to Plant Questions Hotline: 1,735

Number of annual plant sales: 2

Number of items sold at plant sales: 44,602 (including seed packets)

STAFF AS OF APRIL 2003

Full time: 65

Part time and/or seasonal: 39

HOW TO REACH US:

Write: 1201 N. Galvin Parkway

Phoenix, AZ 85008

Call: 480-941-1225

Fax: 480-481-8124

TDD: 480-754-8143

Website: www.dbg.org



MaryLynn Mack: Expanding the volunteer program in new directions

By Carol Schatt

When MaryLynn Mack first interviewed for her job at the Desert Botanical Garden, she knew instantly that it was a perfect fit. She felt so at home at the Garden that she went right back to her apartment and turned down another job that had been offered to her.

"Then I really began to pray the Garden would call me back for the second interview," she said.

And of course the Garden did. That's how MaryLynn came to be the Garden's new community volunteer programs coordinator. Her job is to broaden the base of volunteers at the Garden in new ways.

"I'm responsible for creating a community volunteer program for people who want to give back to the Garden by volunteering their time, but need to work around full time employment or school obligations," MaryLynn explained. "I want to build a more formalized program."

There are six hundred community volunteers listed in the Garden's database, and leadership already has emerged, she said.

Another goal is to develop a youth program for teenagers 13 to 17 years old. "That's the age when kids get diverted into other interests," she said. She plans to attract and hold their interest with programs that are tied to career ideas for them, such as teaching, science, and botany.

"The environmental aspect of the Garden will appeal to them," MaryLynn said, "and kids need to take ownership of something, whether it's teaching other kids or making sure their world is being saved."

A third goal is to diversify the volunteer pool to reflect the same diversity found

among visitors to the Garden. "I am known for taking my show on the road," she said. "I've already been to the Phoenix Urban League to talk to them about the volunteer opportunities here."



MaryLynn Mack at home in the Garden.

Warm and personable, MaryLynn is well experienced to develop her newly created Garden position. Born in Cincinnati, Ohio, she holds a bachelor's degree in business with a minor in political science from the University of Cincinnati. A four year tour of duty with the U.S. Navy took her to San Diego, where she stayed the next twenty years.

MaryLynn is a gospel and jazz singer, and it was performing one evening at a fundraiser for the San Diego Rescue Mission that led directly to her next job: to design, develop, direct, and raise the money to build a women's and children's center for the Mission. "I raised begging to an art

form," she laughed, recalling how she found \$6 million in cash and in-kind gifts to turn an abandoned 36,000-square-foot furniture manufacturing building into a 75-bed refuge for homeless women and children. She ran the center for six years.

Her next job was as director of volunteers at the San Diego Natural History Museum (where she developed a successful program for teenagers). Her four years there were enjoyable and an experience that connected her love of people and love of nature.

Last November, however, it was time for a change and, leaving her 19-year-old daughter at college in California, MaryLynn brought her seven-year-old to Phoenix. "I love Phoenix as a city," she said. "The people are so warm and welcoming. I like cacti, I like geology—as in the mountains, you know—and I'm always cold, so this is the perfect place. And it's so beautiful!"

MaryLynn's second grader has become one of her mother's first recruits; the little girl has earned a Garden volunteer badge and performs her volunteer tasks with the infectious enthusiasm she inherits from her mother.

MaryLynn looks forward to getting back into singing, starting with finding the right church choir to join. She's still in the process of getting to know the area and learning where her new job is going to go.





My favorite memory of the Desert Botanical Garden is: bringing my classroom of 3rd graders, equipped with drawing paper and charcoal, to sketch the Garden. They loved it and so did older guests of the Garden who were visiting. This was in the late 60s and 70s. —Miss Betty Jane Heath

"Where else would I be?"

By Jan Trenter, Volunteer

My first visit to the Desert Botanical Garden was during a spring break trip that brought our family to Phoenix from our home in Minnesota in April of 1965.

It was as though we had come to a foreign country. Many of the plants looked other-worldly, and the sun warmed us. My husband remarked that someday this would be a wonderful place to live. I didn't think much about that statement until twenty years later when a business opportunity brought us back to the Valley, this time to stay.

We arrived for good again in spring and, being a long time gardener, I began to plant my favorite Midwest flowers. It didn't take long to realize that this was an exercise in futility. It occurred to me that there was a wonderful resource just a few minutes away—the botanical garden that I had visited many years before. Right away I became a member AND a volunteer. I needed to learn how to garden in this environment that was so contrary to every concept that I knew regarding my favorite hobby.

I remember going on my first day through the old gift shop to gain admission to the Garden and finding my way to Webster



Volunteer training in Webster Auditorium.



Photograph by Renee Immel

Pratt Ramada

Auditorium where I found about twenty people sitting in a circle with Ruth Greenhouse facilitating a volunteer meeting. There was a demonstration of Native American dance steps and there was food. There was also an immediate sense of being welcome. The people attending seemed happy to see a new face.

The following January I joined the docent training class, which was the only organized volunteer program then in place. I "graduated" as an official volunteer in 1986. Several of my friends from that class continue to be volunteers at the Garden.

Currently volunteers work in almost every department of this institution. The numbers have grown to hundreds, many of those coming in on a weekly basis and others even more often. After my training I began guiding school children and loved it. Not only had I fulfilled my original

reason for coming to the Garden, but I continued to learn about this beautiful desert, which no longer seemed hostile. Eventually I was interacting with visitors from the Valley, from all over our country and from places all around the world, helping them to realize that this is a place unlike any other in our nation.

In the first year I filled a vacancy on the Volunteer Board of Directors as secretary and have since participated on the Board for most of the following years in various positions. It has been a privilege to see this fledgling organization of friends, now called Volunteers in the Garden, grow to be recognized internationally for excellence in recruiting, training and retention of volunteers. This has been accomplished by the close relationship and mutual respect between dedicated and visionary staff and volunteers.

My favorite memory of the Desert Botanical Garden is:

visiting on Sunday mornings, walking up to the Pratt Ramada, sitting down overlooking our magnificent Valley toward the East and North Mountains, as well as Papago Buttes, and then relaxing to the sounds of the Sunday concerts below on Ullman Terrace. Listening to music and taking in God's splendid creations—helped by human hands—spending a perfect moment in time in order to replenish one's soul. —Uta Monique Behrens

The Sonoran Quarterly SUMMER
June 2004 Volume 58, No. 2

I am often asked, "Are you still at the Garden?" My response is always, "Of course. Where else would I be?" I think of a morning when I came in for an early Board meeting to be greeted by a pastel palette of hundreds of Easter Lily Cactus (*Echinopsis* sp.) in full bloom, the excitement of 'seeing' a gray fox settled high in the branches of a mesquite tree along the trail, and of a Tuesday when I arrived to see the washes in the Garden running full after a night of heavy rain. On another evening we shared the joy of seeing fourteen Arizona Queen of the Night blooms in the bed near the first bridge close to Archer House.



Scott Trenter at the Garden on a family trip, 1965.



Scott Trenter at the Garden, 2004.

Our five children all relocated to the Valley. We shared our daughter's wedding up at Pratt Ramada, the highest point along the Garden trails, at sunset. On another evening we celebrated a wedding reception for our youngest son and his new bride on Ullman Terrace where a cactus

wren had the first taste of the wedding cake. My grandchildren have walked the trails with me. My young grandson shared that of all the wildflowers his very favorite was the "baby blue eyes." Members of my family have worked at many *Las Noches de las Luminaria* events and last December I shared the Teddy Bear Tea with my granddaughter. Memories abound.

I love the Garden and am so proud to have shared in its growth. The new buildings make possible work that just could not have been done in our former, limited quarters. I will always treasure the

memories, though, of the beehive-like atmosphere in the tiny kitchen in Archer House as the Sages and docents prepared for a day on the trail. Most of all I remember the people who have made this wonderful place what it is today. I am especially grateful for my mentors, Kathleen Socolofsky and Ruth Greenhouse, and the countless friends, staff and volunteers who have shared so many wonderful times as well as heartaches. There have been too many task forces, pilot programs, trainings, meetings and—yes—potlucks to count. Each time I come to the Garden I meet one friend or another, sometimes a person, but just as often it is a cactus wren or one of the other creatures that share this treasured space.

One thing is certain: there is always a sense of 'coming home.' I feel blessed to have been guided to this amazing place.

Jan Trenter, a volunteer since 1986, serves as a docent on Tuesdays and has chaired the nominating committee for Volunteers in the Garden. A "Hardy Perennial" volunteer, Jan received her pin last spring for 4,000 hours of service to the Desert Botanical Garden. 🌵



Volunteer leading a night tour, early 1980s.



Ruthie Carll heads education department

Ruthie Carll has been named director of education at the Garden. She has been the acting director of the department since September and has worked in the department for more than nine years.

The department offers educational programming in three areas: Student and Teacher programs, relating to formal education from kindergarten through college; Life Long Learning programs, for people not in school; and Volunteer programs in all departments throughout the Garden.



Ruthie Carll

For students and teachers, Ruth said, "we want to improve the quality of the already excellent educational programs by making them more hands-on, experiential, scientific, and investigative."

Life Long Learning programs offer instruction by top teachers in a wide

variety of fields and are designed to create a "conceptual school here at the Garden," Ruthie said. She plans to offer certification programs similar to the Garden's highly successful Desert Landscaper School, which has certified more than five hundred Garden-trained landscape students. The first Life Long Learning courses leading to certification are planned in horticultural therapy and in botanical or natural history illustration and will start in about a year.

Ruthie discovered teaching as her true love while doing her graduate work towards a career in botanical research. To support herself while in school, she worked as a teaching assistant. "I realized I couldn't wait to leave the lab and get back to my classes," she said. With a bachelor of science degree in biology from Georgian Court College in New Jersey, she came to Arizona State University's botany department for her master of science degree. "I intended to return to the coastal environment," she said, "but I loved the desert and couldn't leave it."

She said the staff in the education department "has been doing a wonderful job, and I am so looking forward to working with this particular team to move the Garden's education programs forward to the next level."

Garden attendance soars

Attendance for the months of January, February, and March hit new levels this season as more people than ever before came to the Garden to experience the spring bloom, see the butterflies, participate in special events, and enjoy the John Henry Waddell sculpture exhibition. Preliminary estimates indicate that attendance revenues for the three month period were up 30 percent over last year—well above previous records set in the late 1990s.

The growth in January and February was led by increases in tourist attendance, which has now returned to levels seen before September 2001. The growth in March was fueled by local visitation, posting an increase of 15 percent over last year. Overall, local attendance has more than doubled since the Garden's new facilities were opened in the spring of 2002.

Attendance Revenue Growth:

Month	2003	2004
January	\$ 68,925	\$ 99,502
February	\$ 95,521	\$134,956
March	\$229,933	\$280,000

MESQUITE BEAN COLLECTION TIME



Summer is *the* time for mesquite bean collection.

The Garden uses mesquite beans on the *Plants and People of the Sonoran Desert* Trail for visitors and students to experience pounding them into flour. Your mesquite bean donation this summer will help ensure that this activity is available all year.

Mesquite beans must be tan, dry, crisp, and free of yard debris. Thank you for supporting our hands-on education programs!



Ed Mell's "Radiant Desert" was created exclusively for *Dinner on the Desert's* live auction. This financially successful fundraiser was held April 24, 2004 and celebrated the Garden's 65th Anniversary. Also honored were the many outstanding and committed individuals that helped make the Garden what it is today.

John Sallot joins DBG staff

John Sallot has joined the Desert Botanical Garden staff in the role of development associate. John is responsible for managing the Garden's corporate, foundation, and sponsorship fundraising efforts.



John Sallot

Photograph by Raul Padilla

John is not a newcomer to the Garden. His home landscape was inspired by visits to our plant collection and displays. As a volunteer last fall, John assisted with administration of *Las Noches de las Luminarias* recruitment efforts.

His professional background includes positions as development director for AIDS Project Arizona, communications manager for Palm Springs Desert Museum, and as program manager of volunteer resources for AIDS Project Los Angeles. John also has experience in dot.com marketing and product development. Early in his career he worked in Hollywood television production. His talents and track record with non-profit communications, combined with his enthusiasm for the Garden, will be tremendous assets in furthering the Garden's mission.

Piper grant will help Ken learn Spanish

Ken Schutz, executive director of the Desert Botanical Garden, will be on sabbatical leave in Cuernavaca, Morelos state, Mexico, during June and July, thanks to a fellowship from the Virginia G. Piper Charitable Trust. He will be a full-time student in an immersion-based Spanish language program.

Garden Trustee Dr. William Huizingh will serve as director of the Garden during Ken's absence. Dr. Huizingh was interim director immediately prior to Ken's arrival as director in 2001.

The Piper fellowship will enable Ken to become fluent in Spanish. In addition to taking Spanish classes each day, Ken will live with a host family in Cuernavaca. He plans to visit different Mexican gardens and national parks on weekends. He believes the program will better equip him to lead the Garden's effort to become a bi-cultural institution serving all members of our community.

The Piper Fellows program is in its third year. Eight other leaders of non-profit organizations in Maricopa County have received this prestigious award.

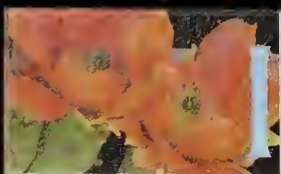


Photograph by Renee Immel

Ken Schutz, Garden director (left), with Edna and James Drake at a ceremony dedicating the Visitor Services Cart Corral. The generous donation from the Drake Family provides a home for the Garden's strollers and wheelchairs. The Cart Corral is dedicated to the memories of: Neil O. and Walter C. Davis, Mildred L. and Joseph E. Drake and Mildred "Mittie" and Scott O. New.

Desert Landscaper School Certification Program 2004 Registration begins June 1. Classes start the week of Sept. 20, 2004.

The Garden offers a Desert Landscaper Certification program to meet the need for quality professional landscapers. These classes provide practical, hands-on learning experiences in landscaping and horticultural topics. The 30 week, 10 month school is offered in three sessions of ten classes each and is taught by the Garden's Horticulture department and guest instructors. Upon completion of the 3-session certification program students will earn, in addition to the certification from the Desert Botanical garden, 7 college credits from Phoenix College, one of 10 Maricopa County Community Colleges. The certification program is offered in English and Spanish. Check our website at www.dbg.org for more information and click on the Desert Landscaper School link. Call 480-481-8161 for more information.



IN APPRECIATION

The Desert Botanical Garden is grateful for the support of all 13,327 members. Recognized here are members of the President's Club, Director's Circle, Curator's Circle, Saguaro Society, and The Sonoran Circle. Also listed are donations and memberships received from December 16, 2003, to March 15, 2004, for Ocotillo Club, Boojum Club, Agave Century Club and Desert Council.

FOUNDER'S CIRCLE

William Huizingh
Jacquie & Bennett Dorrance
Barbara & Donald Ottosen
Carol Schatt

PRESIDENT'S CLUB

Dorothea & Bradford Endicott
Hazel Hare
Edith & William Huizingh
Jocelyn & H. B. Wallace

DIRECTOR'S CIRCLE

Connie & James Binns
Marie F. Doepper
Leo A. Martin
Dorothy Donnelley Moller
Rose & Harry Papp
Penny & Richard Post
Louise C. Solheim
Nancy & Robert Swanson
Connie & Craig Weatherup

CURATOR'S CIRCLE

Neil Allison & Rick Campoy
Carol & Robert Bulla
Geri & Harry Cavanagh
Lee & Mike Cohn
Marilyn & Cliff Douglas
Betty Lou Summers
Shoshana & Robert Tancer
Virginia M. Ullman

SAGUARO SOCIETY

Anonymous (1)
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Donations to the "Dinner on the Desert" will be recognized in the next issue.

We attempt to ensure the accuracy of our donor's names. If you note an error or omission, please contact the Garden's development assistant, Rebecca Spellman, at 480-481-8193.

Photograph by Renee Immel



Photograph by Charlie Cobeen



Calendar of Special Events

**The Garden will be closed
on July 4, 2004**

John Henry Waddell Sculpture Exhibit
Through June 27

Birds in the Garden Tours
Mondays / May through September / 7 a.m.

"Taste of the Desert" Sunrise Tours
Saturdays / June and July / 7 a.m.

Flashlight Tours
Saturdays / June and July / 7:30 p.m.

Story Time
Wednesdays / June and July / 7 p.m.

Family Saturdays
Saturdays / June and July / 9 a.m.

Jazz in the Garden Concert Series
June 4, 11, 18, 25
Fridays / 7:30 p.m.-9:30 p.m. / Ullman Terrace
Call 480-941-1225 for ticket information



The Sonoran Quarterly
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The mission of the Desert Botanical Garden:

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.

The background of the cover is a close-up photograph of several bell peppers. In the foreground, a large red bell pepper is prominent, with a yellow one partially visible behind it. A green stem and leaves are also visible. The entire image is framed by a thin gold border.

THE SONORAN QUARTERLY

The bulletin for members and friends of the Desert Botanical Garden, Phoenix, Arizona September 2004/Volume 58, No. 3



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THE SONORAN QUARTERLY

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Of dreams and visions, hard work and support

Having just completed a session of signing checks for the Desert Botanical Garden, I recently paused to reflect on more abstract matters, such as, "What are the essential factors that contribute to the success (even pre-eminence) of an organization?" These thoughts led to a corollary question, "Have these same factors been critical in the Garden's growth and development?"

In my opinion, the absolutely essential first element is the involvement of key individuals who have the ability to foresee what can be accomplished. I don't suggest that such people are clairvoyant; rather, that they have the ability to construct a mental image of a future that eludes most of us.



Gertrude Divine Webster

Photograph DBG Library Archives

These dreamers often provide a second critical component: a vision of how the institution can contribute to human well-being and can serve the community in which it resides. In the case of the Garden, the original visionary was Gertrude Divine Webster whose foresight was essential to the Garden's creation. Her stated goals are 65 years later incorporated in the Garden's mission statement in these words, "... to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States."

Translating such goals into reality requires inspiration provided by strong leaders. From its inception,

the Garden has been blessed with extraordinarily committed directors, superintendents and trustees who have perpetuated Mrs. Webster's dream.

Equally important is the development of a devoted, hard-working staff whose members function together as a well-integrated team. The individuals who constitute the staff must be inventive and highly motivated if ambitious goals are to be attained. Certainly, those talents can be found in the Garden's team.

Critical, too, is community involvement through service on the governing board. From its earliest days, the Garden benefited from the talents of many community leaders who volunteered their time and financial support unstintingly. Notable among the Garden's long-term supporters was Reg Manning, a nationally syndicated cartoonist for *The Arizona Republic*, who chaired the executive board from 1947 to 1952, and continued his involvement until his death in 1986.

Volunteers can provide invaluable services in a wide range of areas essential to an institution's success. The range of activities in which the Garden's five hundred volunteers are engaged is amazingly



Dr. William Huizingh

Photograph by Jennifer Johnston



Docent with school children.

Photograph by Adam Bodinier



CONTENTS

The Sonoran Quarterly | AUTUMN
September 2004 | Volume 58, No. 3

diverse: conducting tours; as horticulture aides; assisting in the business office, the education department, the library, and elsewhere.

Broadly based community participation both contributes to an organization's success and demonstrates that it is accomplishing its mission. With a membership in excess of 14,000, the Garden is effectively fulfilling its goals and affecting the lives of many residents and non-residents.

Although, as I suggested earlier, the involvement of devoted people is the key to success, little can



Photograph by Adam Rodriguez

Echinopsis hybrid.

be accomplished without financial support. Clearly, serving the community should result in recognition of the value of what is provided. The Garden has been the beneficiary of monetary and non-monetary contributions from individuals, corporations, foundations and governments.

As an aside, I wish to thank Ken, the Board of Trustees, and the staff for making my two-month service as acting director a pleasant and rewarding experience. ☀

—Dr. William Huizingh
Acting Director

Dr. William Huizingh, longtime trustee of the Desert Botanical Garden, sat for the second time as interim director of the Garden during June and July when Ken Schutz, the Garden's Dr. William Huizingh executive director, was on leave of absence to study Spanish in Mexico. Dr. Huizingh, whose most recent term as trustee ended in May, was elected Trustee Emeritus at that time by the membership of the Garden.

ARTICLES

Seeds of Success at Desert Botanical Garden	4
Ancient agave cultivars and ancient peoples	6
Luminaria 2004 information	11
New World Harvest festivals	12
English gardens, palaces, London & Queen Mary 2	13
65th Year: It takes a village of volunteers	14

FEATURES

Desert Journal: Of dreams and vision, hard work and support	2
Someone to Know: Marie Gant	13
Garden News	16
Smithsonian CultureFest	
Desert Landscaper School	
Cactus scientist joins staff	
Garden hires propagator	
The Fairchild Challenge	
Fall Plant Sale Festival	
In Appreciation	18
Music in the Garden	20
Calendar of Special Events	20

ON OUR COVER

'Cubanelle' chile pepper *Capsicum annuum* in the Center for Desert Living Herb and Vegetable Garden. One of the plants featured during New World Harvest.

Photograph by Adam Rodriguez
adamsphoto@cox.net

Seeds of Success at Desert

By Kathleen Rice

Since 2003 the Garden has participated in a multi-institutional cooperative effort to provide seed collections to the Millennium Seedbank Project at Kew Gardens, Wakehurst Place, England. This nationwide effort in the United States began with a cooperative agreement between the Millennium Seedbank and, in the U.S., the Bureau of Land Management (BLM). It is called "Seeds of Success" and in addition to building the Millennium Seedbank in England, also contributes to a U.S. seedbank used for ecological restoration projects by the BLM.



Collecting *Garrya flavescens*

The project calls for collecting 20,000 seeds of fifty species per year over a three-year period. At least two other botanical gardens are also participating in this project.

The world-renowned Millennium Seedbank at Kew has taken on the vast mission of documenting approximately 24,000 plant species throughout the world (estimated to be one-tenth of all plant species in the world) with seeds and herbarium specimens over a ten-year period. The British lottery funds the Millennium Seedbank and initially contributed money to the BLM for

seedbanking common plant species of the United States not already in the Millennium Seedbank. A national coordinator for these seed-collecting activities was established in Washington D.C., and Carol Spurrier was hired by the BLM to implement the Seeds of Success program. Additional funding for the project came from surplus funds originally budgeted for restoration following fires on U.S. Department of Agriculture, U.S. Forest Service, and BLM lands.

Over the next three years the Desert Botanical Garden will receive \$208,000 to support our work with Seeds of Success. These funds pay the salary and all associated expenses for a botanist to coordinate seed-collecting activities.

Nearly all the Garden's research department is involved with this project, forming an effective, highly experienced collecting team. First, botanists Wendy Hodgson and Dixie Damrel focus on areas of botanical interest to the Garden, relaying location of potential collecting sites to field botanist Sarah Hunkins and two Student Conservation Association volunteers, Hal Gunder and Betsy Davis. Sarah, Hal and Betsy foray daily into the desert to collect voucher herbarium specimens and seeds according to the strict protocol outlined by Seeds of Success.



Field biologist Sarah Hunkins collects *Glandularia*



Student Conservation Association volunteer Hal Gunder presses *Penstemon*.

Dr. Joe McAuliffe, director of research, provides valuable insights into habitat and geological characteristics, and has been instrumental in creating the research department collecting team. Kathy Rice, curator of rare plants, administers the project, and the Garden's accounting department tracks financial support and expenditures for the project.

Collecting the seed is extremely challenging because of the project's strict standards for quality and quantity. Initially, field trips must be made to collect plant species in flower in order to create herbarium voucher specimens (pressed plant specimens). These herbarium specimens are carefully studied under a microscope to verify their identifications. Herbarium specimens are then sent to various institutions as reference material for the seed collections. The institutions where these duplicate voucher specimens are held

Botanical Garden

include Kew, the Smithsonian, Arizona State University, and Desert Botanical Garden.

Because the seeds of a plant usually are immature while the plant is in flower, careful documentation of site locations is required so that the seed collectors can later find the same sites to collect mature seeds. Gauging the timing of maturity and how ripe the seeds are requires experience gained only by making several trips to collection sites. Plants in seed are often very different in appearance than they are when in flower.

Collecting the seed is not easy. Collectors face the desert's extreme challenges: summer heat; the defense systems of Sonoran Desert plant species; insects and snakes. Most seeds of desert plant species ripen to maturity during the hottest months of summer, and staff and volunteers involved in collecting are exposed to intense extremes of sun and heat. Collecting seeds from plants that grow low to the ground such as *Marina parryi* require repeated bending, and even crawling. The Christmas cholla,



Student Conservation Association volunteer Betsy Davis gathers seeds.

Photograph by Sarah Hunkins



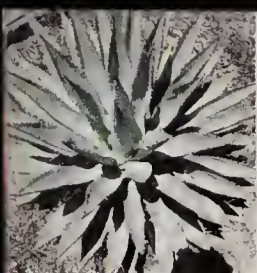
Hal helps Wendy Hodgson, senior research botanist, locate plants in the field. Later the team will return to collect ripened seeds.

Opuntia leptocaulis, was one of the collected species; botanists collecting its seeds were inundated with the ubiquitous, fine glochids that all *Opuntias* have. Seed collectors are continually subjected to thorns, spines, and prickly hairs. They also experience insect bites and can encounter snakes. Frequently the team must camp overnight in the desert during summer.

The Seeds of Success project provides exciting opportunities through the support of existing Garden research and herbarium activities while at the same time adding

to the Millennium Seedbank at Kew and a restoration seedbank for the BLM. Seeds of Success also enhances the already internationally renowned research team at Desert Botanical Garden, assisting with financial support of ongoing projects of botanical interest.

Kathleen Rice, of the Garden's research department, is curator of the Rare Plant Collection.



Ancient agave cultivars and ancient

by Wendy C. Hodgson

For nearly twenty years the Desert Botanical Garden has been involved with exciting research about agaves and their pre-Columbian agriculturists.

In the early 1980s, Arizona State Museum archaeologists Paul and Suzanne Fish theorized that the Hohokam farmed agaves extensively, based on their finding numerous agave artifacts among agricultural features in southern Arizona although no agave currently exists in these areas.

Former Garden research associate Rick DeLamater subsequently found *Agave murpheyi*, or Hohokam agave, in the hills north of Phoenix. It is known from only about sixty scattered sites in central Arizona. Plants are grown in gardens in southern Arizona and northwestern Sonora. This agave is often found in association with archaeological features including room foundations of rock, agave *tablas* and knives (for digging out and preparing the agave for roasting), rock piles, linear alignments and check dams, the latter three being agricul-



Drs. Paul and Suzanne Fish, Wendy Hodgson and Dr. Peter Pilles surveying the landscape.

tural practices for retaining or directing water runoff for farmed plants.

For the first time we now have evidence suggesting agave production not only by

archaeological features, but through actual living agave plants whose ancestral lineage is traced back directly to plants once farmed by early Hohokam farmers possibly as early as 900 to 1250 A.D. These are living archaeological features within the landscape. Although it has long been known that agaves were cultivated in MesoAmerica, there was no evidence prior to 1980s that pre-Columbian peoples grew agaves in arid North America. The studies by the Fishes and subsequent research are major steps toward our understanding of how early cultures sustained themselves and related to their natural and cultural environment. It is a rare opportunity to be able to study plants that have changed little since they were farmed centuries ago.

Rick DeLamater was very knowledgeable about which agaves normally occurred in Arizona and northern Mexico. While searching the foothills of Tonto Basin in Gila County, he happened onto another agave that appeared different from any others he knew. Like the Hohokam agave, this particular one often occurred



Dawn Goldman with flowering *A. phillipsiana* near Hidden Valley, summer 2003.

peoples: a synthesis of our research

sporadically atop terraces overlooking permanent water and in close association with archaeological features. Unknown to us at the time, agave specialist Susan McKelvey also had found this agave, in the late 1930s. Thinking it might be a new species, she had hoped to get flower material for William Trelease, a prominent botanist and agave specialist at the time, so that a description might be made, but she was never able to do so. Nearly sixty years later, Liz Slauson and I described it as a new species, naming it after our friend, Rick DeLamater. Recently additional clones have been found outside Tonto Basin in the Verde Valley.

But the story does not stop here. Instead, it becomes more complex; for every one question answered, additional questions are asked. In two previous articles published in *The Sonoran Quarterly*, I discussed finding and describing another agave I named *Agave phillipsiana*, believed to be an ancient cultivar in the Grand Canyon. This plant is not to be confused with the wild, native Utah agave, *A. utahensis* (ssp. *utahensis* and ssp. *kaibabensis*) that commonly occurs within the Canyon, and that was and continues to be used for food and fiber. At the time, *A. phillipsiana* was known with certainty from only

three sites within the great chasm, and like *A. murpheyi* and *A. delamateri*, found near pre-Columbian agricultural and habitation features permanent water. And, like *A. murpheyi* and *A. delamateri*, these plants have been able to persist for all these centuries because of their ability to reproduce vegetatively. In other words, because they can produce small plants, or "pups," from their underground stems (rhizomes), the group of plants (clone) has been able to persist since they were farmed and later abandoned by early cultures, in this case, Kayenta Anasazi.

In retrospect, this agave proved to be our "smoking gun" with regard to the question of whether agaves were cultivated by pre-Columbian cultures north of the border.

How much do we now know in this exciting area of research? Much has happened in less than a year. We know that *A. phillipsiana* occurs in more places than the Grand Canyon. While looking for another kind of agave, we found clones near Hidden Valley, overlooking Oak Creek in Yavapai County. In later surveys we found numerous clones on hill slopes overlooking the Hassayampa River near Wilhoit as well as additional clones at Pulatki ruin near Sedona. We now believe that Verde Valley is a "hot spot" for agave cultivation, or that at least in this area more of the plants have been able to persist.

With helpful tips from photographer Max Licher and botanist Jean Searle of Sedona, we found an additional type of agave that has all the markings of another cultivar. It is similar to *A. chrysantha*, which is found at higher elevations above the Verde Valley. It differs, however, in having small, uniform rosettes, numerous offsets, lack of variability in leaf characters, pale yellow-green flowers, and little or no seed (*A. chrysantha* is highly variable, pups sparingly, and produces orange-yellow



Photograph by Wendy Hodgson

Diminutive *A. delamateri*-like plant on hill with *A. phillipsiana* and *A. delamateri* near Sedona.

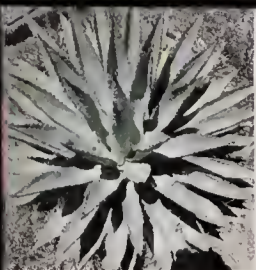
flowers and much seed). It clearly represents a plant that has arisen through cloning but the answer to whether it is a mutant or a result of hybridization with another agave is unknown. These plants have thus far been found only in the vicinity of Hidden Valley, Page Springs, and south of Sedona, occurring near permanent water. Very large clones are found on hilltops with extensive pre-Columbian habitation sites.

Additional surveys have discovered yet another type of agave different from the previous four, occurring in and adjacent to Verde Valley. It has been located at five sites, three of which are near Montezuma Castle and Sacred Mountain. Plants are strikingly similar to *A. delamateri* but its rosettes, leaves, inflorescence and flowers are much smaller. Its appearance also suggests that of a highly cloning *A. shrevei* ssp. *shrevei* from northern Mexico. Like the aforementioned agave cultivars, its flower stalks are all produced at one time, with close synchrony of flower



Photograph by Wendy Hodgson

Dixie Damrel with pre-Columbian check dam in Verde Valley.



Surveying diminutive agave near Sacred Mountain.

development. And, like the other cultivars, its origin is unknown, possibly having arisen through mutation or hybridization involving other, unknown agaves.

Without a doubt, one of the most exciting finds was made recently by Garden staff, intern Andy Neil and volunteers Dawn Goldman and Dara Stewart. Returning somewhat dejectedly from a survey trip that resulted in finding no agave, we suddenly observed a cluster of stalks high on a hill overlooking Oak Creek. We knew the highly edible and fibrous Parry's agave (*A. parryi*) occurred there at higher elevations but decided it best to check out this site. (We have learned that all agaves in or near the Verde Valley should be checked as the chance for finding a cultivar is high.) Getting to the site requires climbing an arduous route but we were rewarded with an astonishing find. There were not just one cluster of agaves but many, and more than one type: *A. phillipsiana*, *A. delamateri*, and its diminutive look-alike that has not yet been identified covered the south-facing slope near the top, placing three of the five known agave cultivars here in this one area. We now have evidence that

ancient people grew more than one type in one place.

All of this poses a number of questions. One is, why spend the energy and resources to farm agaves when other native edible agaves grew nearby? Part of the answer is that all five cultivars possess characteristics that would favor their production and use as compared with those agaves native to the area (Table 1).

- Harvesting agaves requires considerable energy, and traveling great distances in difficult and sometimes dangerous country would be necessary to find enough "wild" agaves for food or fiber.
- Plants resulting from vegetative reproduction produce a flowering stalk at the same time, which would be beneficial to the harvester.
- Agaves whose leaves are easy to cut and have smaller teeth would be easier to harvest with stone tools.
- The production of bulbils (small plants) in the flower stalks of *A. murpheyi* provides plants for trade and convenient to be carried on trips.
- Vegetative reproduction allows a farmer to grow plants with the same positive attributes generation after generation. Although vegetative reproduction can be a double-edged sword because the plants' lack of variability may put them at

a disadvantage in a changing environment, this factor can, however, be offset in that the plants would usually be tended and not have to fend for themselves. Crop pests such as Agave snout-weevil or killing frosts might wipe out much of the crop. Perhaps those early farmers allowed some hybridization to occur with wild agaves (although today there are few, if any, in immediate areas of the cultivars), thereby instilling some genetic variability.

Prior to our finding more than one agave cultivar growing together, I had wondered why people would have cultivated one type in a given area, which would have flowered only at a certain time, all at once. To use a resource available for only a short amount of time would have required a capacity to store dried baked agave. Now, however, we realize that in one area they grew different types of agaves that would flower at different times of the year (Table 2).

Harvesting the agave hearts for food is best done before the stalk emerges from the leaves. Cultivating several species of agaves extended the harvest. For example, by the time the flower stalks of *A. parryi* had matured and their flowers opening, the flower stalks of *A. phillipsiana* and *A. delamateri* might still be immature

Table 1. Characteristics that were possibly selected for in cultivated agaves, with corresponding character in native, untended agaves

Species:	<i>A. delamateri</i> *	<i>A. phillipsiana</i> *	<i>A. murpheyi</i> *	<i>A. chrysantha</i> **	<i>A. utahensis</i> **	<i>A. sp. 1</i> ***	<i>A. sp. 2</i> ****
Characteristics							
<u>Rosettes</u>							
Size	Large	Large	Large	Small to large	Small to large	Small	Small
Single or pups	Pups	Pups	Pups	Single/sparingly pups	Single/sparingly pups	Pups	Pups
<u>Leaves</u>							
Easily cut	Yes	Yes	Yes	No	No	Yes	Yes
Small marginal teeth present	Yes	No	Yes	No	Moderate	Yes	Yes to moderate
Variable in size, shape or color	No	No	No	Highly	Moderately	Very little	No
<u>Flower stalk</u>							
Synchronous	Yes	Yes	Yes	No	No	Yes	Yes
Bulbils produced	No	No	Yes	No	No	No	No
Seed Produced	No	No	Rarely	Yes	Yes	Few if any	Few if any

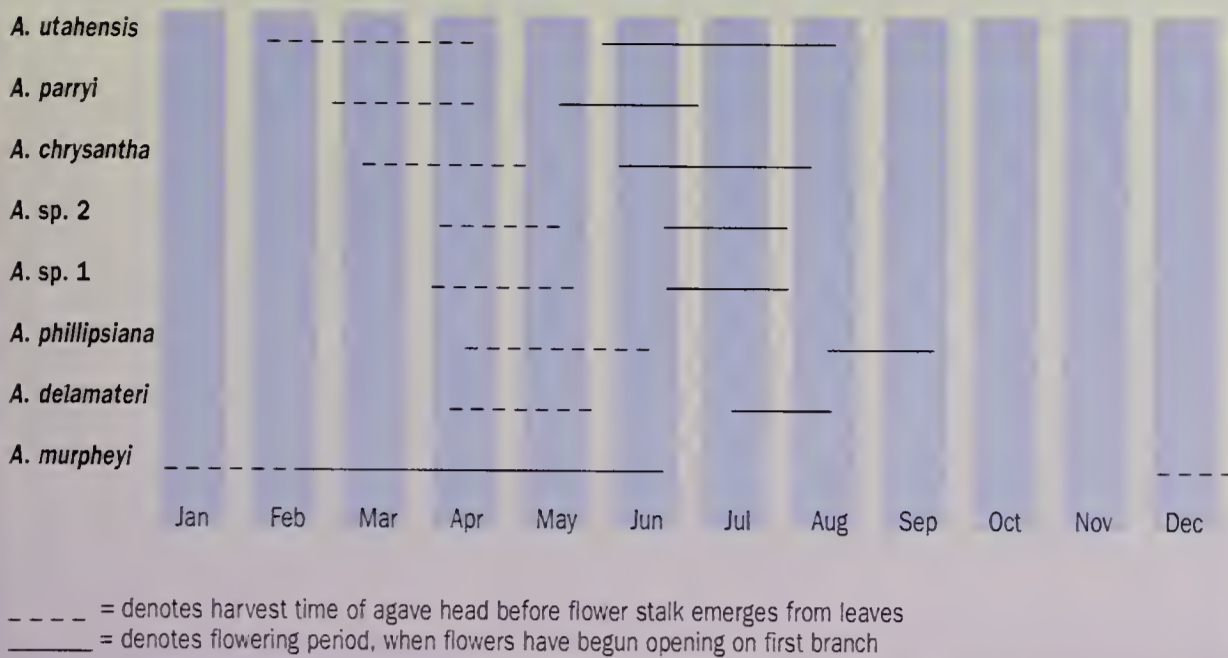
* = pre-Columbian cultivated agave

** = wild, native agave

*** = unnamed pre-Columbian cultivated agave with *A. chrysantha* similarities

**** = unnamed pre-Columbian cultivated agave with *A. delamateri* similarities

Table 2. Flowering and harvesting times for cultivated and native agaves.



and available as food. Thus the different flowering periods among the five cultivars effectively extended the agave harvest period.

It was important that baked agave could be stored for winter use because this was the time when fresh food resources, including agave, were often unavailable. Access to *A. murpheyi* enabled people to harvest fresh agave during the dead of winter.

There are many unanswered questions, and surely others will be posed: 1) Where did these plants originate and what agaves are their progenitors? 2) Were they a mutational variant of which people were keenly aware, whose attributes were such that growing and harvesting them would be easier or more productive? 3) Were plants purposefully selected based on favorable attributes, thereby improving those qualities over time? 4) Did people cross-pollinate certain agaves to produce different types and for what reason? 5) How extensively were these plants cultivated? 6) How often were these plants introduced into an area? 7) How many types of agaves were grown at any one time or throughout time of habitation? Why cultivate small agaves? Were they better-tasting or required less baking in an environment whose fuel resources may have been limited? Are we seeing a handful that have been able to persist all these years without the help of people, while other types have since disappeared? 8) Why

would they grow different types in Verde Valley area yet grow only two types of agave (*A. murpheyi* and *A. delamateri*) in Tonto Basin, or have other agave types disappeared? 9) What groups traded these agaves and with whom and for what? Can our agave research and knowledge about other plant distributions identify trade (and possibly migration) routes that served as interregional trade routes in prehistory, as noted by Helen Fairley in her recently published book, *Changing River: Time, Culture, and The Transformation of Landscape in the Grand Canyon* (Statistical Research, Inc. Technical Series 79)? And finally, 10) How can we protect these rare cultural and natural resources given the fact that possible hybrids or plants whose existence depended on people are not protected by the Endangered Species Act? I am formulating answers and



Low-tech storage of samples in the field.

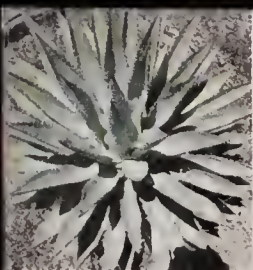
thoughts and will share them in another *Sonoran Quarterly* article.

We are receiving needed help in answering some of these questions, including how and from where the plants originated, how often the plants were introduced, and to which agaves are they most closely related. Funded for three years by the National Science Foundation, a team of scientists from the University of Georgia is doing extensive molecular analyses of all of the potential cultivars as well as other agaves believed to have possibly played a role in their origin. Researchers are analyzing all members of the group Ditepalae, as described by Dr. Howard Gentry, the great American agave specialist and early Desert Botanical Garden research scientist. That group includes *A. chrysantha*, *A. murpheyi*, *A. delamateri*, *A. phillipsiana*, *A. palmeri*, *A. applanata*, *A. shrevei* and others, all of which were important sources of food and fiber and continues to be in some places.

In addition, agaves that show no close relationship are also being analyzed, so as to provide a good baseline for comparison and contrast.

The scientists' initial findings are of interest. One would expect little variation in plants that reproduce only through cloning, but to the contrary, preliminary results show a great deal of variation at the molecular level for *A. murpheyi*. Much remains to be learned from their analyses and we are eager to hear further findings.

What does the future hold? After spending a number of years combing areas that I believed were suitable for agave cultivation, I felt it important to share our findings. We are excited to have the interest and support of the National Park Service (Grand Canyon, Tuzigoot, Montezuma Castle and Well), Forest Service, Yavapai Nation, Bureau of Land Management, Bureau of Reclamation, and Arizona Ethnobotanical Research Association. Our continued collaboration with



Photograph by Wendy Hodgson

University of Georgia scientist Dr. Kathy Parker collecting leaf samples of *A. murpheyi* for molecular studies.

archaeologists is also critical. Recently Garden staff had the privilege of sharing our findings in the field in Verde Valley with Suzanne and Paul Fish of the Arizona State Museum, Coconino National Forest archaeologist Peter Pilles, and others, all ardent supporters of our work. Too often, archaeologists and botanists have worked independently. We are hopeful that this trend is changing because interdisciplinary involvement is vital to this research.

We have discussed the possibility of including one large *A. delamateri* site in Camp Verde on the National Register of Historic Places, and thought about how Yavapai students might monitor and care for it. Involving others is not only good sense, but critical. Forest Service and National Park Service personnel, Colorado River guides and others are keeping an eye out for these rare plants.

The molecular project will be ending soon. University of Georgia scientist Dr. Kathy Parker, her colleagues, and I realize that this project requires far more work. More samples will need to be analyzed, including plants from northern Mexico. Cytological, or chromosome, analyses can tell us about possible cultivation and

relationships among plants. (Cultivated plants tend to have more chromosomes and abnormalities.) And there is always the need for additional surveying in potential agave cultivar habitat. Plants once dismissed as "normal" wild species need to be evaluated more critically within their cultural landscape.

Our work is part of a growing trend in field studies to observe plants in the

cultural as well as "natural" landscape. We are realizing that more plants than we had thought—particularly those useful to mankind—have been influenced by human intentional or unintentional activities. Recently Dr. Abisaí García, an agave expert from Mexico City, named two agaves in central Mexico that were found in association with pre-Columbian sites. We are now looking at the landscape in a different way. ☀

Agave connections: a long line of interests

There is another aspect of our agave study that I find to be of great interest. I have already talked about the connection between humans and agaves in ancient times. There is, however, another agave-human connection that continues to this day.

This connection involves those people to whom the study of agaves was a major focus of their lives. The efforts and lives of Susan McKelvey, Rose Collom, and Dr. Howard S. Gentry continue to impact and influence the Desert Botanical Garden and its staff.

Rose Collom, a Georgia aristocrat turned self-taught botanist living in the wilds of the Mazatzals, had close ties with the Garden and was made an Honorary Life Member after World War II. She had given numerous books and plant specimens to the Garden. Her information, which she also unselfishly gave, helped authors Thomas Kearney and Robert Peebles write their *Arizona Flora*. In addition, her cacti collections and observations assisted Britton and Rose to compile their magnificent study, *The Cactaceae*. A number of plants, including the Rock Echeveria (*Dudleya saxosa* var. *collomiae*) are named after her.

Her spirit continues to inspire and influence me in my endeavors as a scientist at the Garden. Last year, Dawn Goldman and I visited Susan Eubanks, librarian for Grand Canyon National Park. Susan knew I was

interested in agaves and the Canyon's flora and pulled out a letter from the library archives. Much to my surprise, the letter concerned our Grand Canyon agave, *A. phillipsiana*, and was written in 1933. Apparently I was not the first person to discover and talk about this rare agave. The letter was from Dr. August Breitung, an agave expert at that time, who replied to an inquiry requesting the possible identification of an agave found in a side canyon within the Grand Canyon. The person asking for his help was Rose Collom, who became the Grand Canyon's first botanist.

Nearly seventy years later I searched this same side canyon and found those same plants. Four years after that discovery I learned that I was not the first botanist to find them. Not only do Mrs. Collom and I share an interest in unusual agaves, but we also share an interest in the Grand Canyon.

Long commitment is necessary for understanding complex interrelationships among plants, let alone plants and people. As this one study illustrates, botanical inquiry is often a long, multigenerational effort. And I am convinced that people in our past can and do affect our lives in ways unbeknownst to us. ☀

Wendy C. Hodgson is director of the Garden's herbarium and senior research botanist.

Las Noches de las Luminarias

Holiday lights, with no strings attached

The 27th annual *Las Noches de las Luminarias* will begin this year on the day after Thanksgiving in order to accommodate all local residents and winter visitors—and their out-of-town families and guests—who hope to attend this extraordinarily popular holiday tradition at the Desert Botanical Garden.

Building on public reaction to last year's expanded *Luminaria* schedule, the Garden has added five additional evenings to this signature Valley event. Of course, members have their customary opportunity to enjoy evenings reserved for them and their guests during the first weekend in December. There are fourteen additional nights, open to members as well as the general public, in the month of December.

The Garden is dedicated to maintaining *Luminaria* as an intimate and festive family experience by providing on-site parking, limiting the number of tickets sold each night, and ensuring quality entertainment and food. Many popular entertainers will return to perform at the event as well as acts new to the *Luminaria* line-up. Arcadia Farms *Taste of the Desert* will once again prepare southwest holiday dinners available for purchase in Dorrance Hall. Several cookie and cider stations will be located along the

trails where guests may purchase these holiday treats they have come to enjoy. The Garden Shop will be open each evening for gift buying.

Members may order an unlimited number of tickets at a discounted rate by mail for any night of *Luminaria* beginning in early September. An invitation outlining all the details of *Luminaria* 2004, will be sent to Garden members this fall.

Telephone ticket sales to the general public (including members) will begin on Friday, October 1. Because tickets to *Las Noches de las Luminarias* sell out quickly, we encourage members to order their tickets well in advance to guarantee the night(s) of their choice.

Ticket Prices: Non-members: adults \$15, children \$7.50 (3-12). Children under 3 are admitted free. Members: adults \$13, children \$6.50 (3-12). Children under 3 are admitted free. Group discounts are available for 25 or more people, call 480-481-8104 for more details.

Hours: 5:30-9:30pm nightly.
Free parking in the Garden parking lot.

Let your light shine at *Luminaria*

Would you like to help at the Garden and enjoy one of the Valley's most popular holiday events?

Join the *Luminaria Light Brigade* 2004, a group of wonderful people who band together once a year to place, light, and snuff more than six thousand candles, greet visitors, act as path guides, hand out programs and assist with a variety of other jobs that help make *Las Noches de las Luminarias* a shining success.

Who are the Light Brigade? Garden volunteers, members, friends, neighbors, families, companies, and community groups. So gather together you and yours for a delightful evening at the Garden. We have expanded to seventeen nights, so your help is needed more than ever to ensure the continued success of this fantastic event. Please contact MaryLynn Mack, community volunteer coordinator at 480-481-8197 or e-mail mlmack@dbg.org to schedule your night of volunteerism.

Thank you for your support, energy, and enthusiasm!

Dates:

November 26, 27, 28	<i>Luminaria</i> (general public)
December 2, 3, 4	Members-only weekend
December 9, 10, 11	<i>Luminaria</i> (general public)
December 16 thru 23	<i>Luminaria</i> (general public)

Supported, in part, by
Arcadia Farms, Phoenix
Coca-Cola Bottling Company,
Southwest Gas and Strategic
Alliance Marketing



New World Harvest Fall Festivals at the Desert Botanical Garden

Butterflies, gourds, pumpkins, ethnic celebrations, chiles & chocolate!

New World Harvest Festivals presented by **APS**



Photograph by Adam Rodriguez

Mariposa Monarca Butterfly Exhibit

10 a.m.-4 p.m. / Marshall Butterfly Pavilion
Garden Members' Preview: October 1
Open to Public: October 2-November 7
FREE for members. \$2.00 for non-members,
with paid Garden admission, 3 years & older
Mariposa Monarca, presented in English and Spanish, takes a dynamic approach to presenting one of nature's most amazing creatures, the Monarch butterfly. This exciting educational experience will feature live Monarch butterflies and interpretive displays about the life cycle, migration patterns, environmental threats and conservation efforts of Monarchs. Discover the amazing journey of millions of Monarch butterflies each year across thousands of kilometers from Canada through the U.S. to the threatened enclaves of Mexico's Oyamel fir forests.

Monarch Butterfly Celebration

October 2-3, 10 a.m.-3 p.m.

Just in time for Desert Botanical Garden's fall celebration of plants, animals and people of the new world, we welcome a new live butterfly exhibition featuring Monarch butterflies. With the opening of the new exhibit comes a two-day celebration featuring family activities, entertainment and interactive demonstrations focusing on these delicate and beautiful creatures.

All New World Harvest activities are free with membership or admission unless otherwise noted and are subject to change.

Gourds Galore! Festival

October 9-10, 10 a.m.-3 p.m.

Discover the beauty and versatility of gourds from local gourd artists demonstrating and selling their art. Family activities include seed planting, face painting, gourd decorating and live entertainment. Visitors can learn about gourds through instructional gourd demonstrations.



Photograph by Gene Almendinger

The Great Pumpkin Festival

October 23-24, 10 a.m.-3 p.m.

Take a \$1 hayride, with paid admission, to the Garden's very own pumpkin patch where each day the first 1,000 children (age 12 and younger) can pick their own free pumpkin. Enjoy face painting, the Amazing Bale Maze, balloon artistry, pumpkin decorating and more. There will be a baked goods market by Arcadia Farms as well as a New World Harvest Market where visitors can purchase new world produce such as unique pumpkins, gourds, and chili ristras.



Photograph by Gene Almendinger



Photograph by Gene Almendinger

Día de los Muertos Celebration

October 30-31, 10 a.m.-3 p.m.

Celebrate this traditional Mexican holiday with authentic Mexican food and pastries; live entertainment including a ballet folklórico and mariachis; activities for the whole family such as flower making and a sugar skull decorating demonstration. Local Latino artists will demonstrate and sell Mexican art and curios in the Garden's Mercado. *Día de los Muertos* is a joyful holiday when families honor their deceased relatives and celebrate the continuity of life.

Native American Recognition Days

November 6-7, 10 a.m.-3 p.m.

Explore Native American culture through traditional song and dance, local artists demonstrating and selling their art plus many other family activities. Authentic fry bread and other delicious treats will be available for purchase. The weekend will begin with a sunrise yoga ceremony that highlights Native American culture and traditions. *Attendance at the yoga ceremony requires pre-registration and fee.*

Chiles and Chocolate Festival

November 13-14, 10 a.m.-3 p.m.

Tease your taste buds at the Garden's Chiles and Chocolate festival where visitors can sample chili and chocolate products from local vendors, as well as have the opportunity to purchase unique Southwest gifts. Families can enjoy an array of activities and listen to hot n' spicy entertainment.

SOMEONE TO KNOW

Marie Gant

Marie Gant has often been at the right place at the right time.

That's how, she believes, she wound up at the Desert Botanical Garden.

Marie joined the Garden staff in May as the administrative coordinator, a position in which she acts as liaison between the director and staff. She helps the staff in organizing their projects and getting their paperwork done. She also coordinates meetings for the Garden's board of trustees.

Marie has administrative professional experience in both the corporate and academic worlds. One of Marie's key strengths is organization, so her expertise will facilitate the flow of information between departments.

"I see my job as making everyone else's easier," she said.

A native of Wyoming, Marie came to Phoenix "on a lark" in 1968 with a friend. "We just wanted to get out on our own. I didn't really expect to stay."

Driving around town, Marie saw the newly opened Del Webb Building on Central Avenue. She liked the way it looked, and though she was driving a Chevy, she got a job with Ford Motor Company, who had taken offices in the building. This was the start of a twenty-year career with Ford.

When the Ford offices closed in the early 1990s, Marie attended Arizona State University West, where she received her Bachelor of science degree from the School of Management, graduating *summa cum laude*. After taking a grant-writing course at ASU, Marie decided to pursue a career in the world of non-profits in order to combine her writing skills and desire to make the world a better place. Upon graduation she accepted a position with the Washington Elementary School District in the grant development department. One of her favorite grant-funded projects was encouraging



Marie Gant at the Garden.

7th and 8th grade girls to pursue careers in math and science.

When an opportunity for change presented itself, Marie accepted a position at Thunderbird, The Garvin School of International Management (formerly known as Thunderbird, The American Graduate School of International Management). At Thunderbird she managed a grant-funded program, CIBER (Center for International Business Education and Research), and more recently was administrative coordinator for overseas programs.

Marie believes that if you keep moving forward and never give up, you just might be lucky enough to find yourself in exactly the right place. For her, the Garden is precisely the right place at which to work—a dream come true. Everyone at the Garden is enthusiastic, friendly and dedicated to excellence, Marie says, and she is looking forward to doing her part to make the Garden a stellar experience for all members and visitors.

Marie has already endeared herself to her colleagues because of her sunny disposition, her team spirit, her work ethic, her organizational skills and her love of the Garden.

Marie's favorite activity away from the office is taking her two dogs on Arizona road trips—she now drives a Ford—to such places as Miami-Globe and the Boyce Thompson Arboretum at Superior. "The most beautiful is the Devil's Canyon drive from Superior to Globe," she said.

English gardens, palaces, London and Queen Mary 2

VanGuard Tours and Cruises is offering Desert Botanical Garden members a special opportunity to participate in a twelve-day, eleven-night tour of gardens, palaces, and castles of Great Britain as well as a transatlantic crossing on the Queen Mary 2 and a London land tour. A contribution will be made to the Desert Botanical Garden for each Garden member who participates. The excursion is scheduled June 9-20, 2005, and includes:

- Seven-day, six-night cruise transatlantic crossing aboard Cunard's QM2 departing from New York City;
- Six days, five nights in London in superior 1st-class accommodations, breakfast included;
- Return airfare from London to New York City;
- Seminars at sea featuring Holly Shimizu, executive director of the United States Botanical Gardens, and Osamu Shimizu, landscape designer;
- Varied tours, including the Royal Botanic Gardens at Kew, Hampton Court Palace and Privy Gardens, Kensington Palace & Gardens, Leeds Castle and Gardens, Great Fosters & Gardens and Windsor Castle.

Optional tours may be added to Sissinghurst Castle and Gardens in Kent and the Hidcote Manor Gardens in the Cotswolds.

Complete package price begins at \$2,995, with upgrades available. Alternate tour dates and seminars at sea are also available.



For a complete itinerary, deck plans, and video or DVD, call VanGuard at 1-800-624-7718.



My favorite memory of the Desert Botanical Garden is:
Going weekly to watch a gigantic cactus ready itself to bloom and do so!
—Francis and Peggy Jane Nickerson

The Sonoran Quarterly | AUTUMN
September 2004 | Volume 58, No. 3

It takes a village—of volunteers

By Mary Cochran, Volunteer

As I stroll the Garden's paths today, it is hard to imagine how it must have looked to those intrepid founders in 1939 when only a fraction of the spectacular plants we now enjoy were in the ground. The founder of the Desert Botanical Garden, Gertrude Divine Webster, herself a transplant, saw the possibilities of what could and should be done to preserve the desert. I like to think of her as our first dedicated volunteer as well as our founder.

Legend has it that volunteers did come to the Garden in those early days. The wives of the directors took on the role of working with them in the 1950s and 1960s. In the late 1970s, I became acquainted with Mary Bess Mulhollan, who would become the first president of the Garden's volunteers. Mary Bess ignited my interest as she sparkled with excitement about the Garden; I became a volunteer in 1987.

When Mary Bess arrived at the Garden in 1979, however, there was no volunteer organization, although docent training had begun in 1977 and there was a staff position for a coordinator of volunteers. Even so, Mary Bess and some of the other volunteers felt they were



Photograph DBG Library Archives

TEMPE (Ariz.) DAILY NEWS, Monday, August 29, 1977

Desert Garden Seeks Docents

The Desert Botanical Garden educational department annually conducts tours for approximately 8,000 school children and approximately 110 tourist groups. To improve the level of instruction, a docent program is being initiated. The program consists of an information class consisting of six weekly sessions beginning in early October.

The classes will offer information on desert plants, Garden history and activities. The free classes will also help the docents with group leading techniques and answers to common questions the children and tourists ask.

The docents, who must be Desert Botanical Garden members, will be asked to continue at least two years, giving approximately 16 hours volunteer time per month.

Call Sherry Krummen at Desert Botanical Garden, 947-2800 for details.

News clipping DBG Library Archive

sometimes more "of a burden to the staff than a help." These volunteers met for what they called mountaintop lunches at the Pratt Ramada and discussed ways they could be of more service, relying less on the staff to find things for them to do.

The volunteer organization, *Friends of the Garden*, was born from these meetings. In April 1983, Friends became official with the election of four officers and the designation of nine committee heads. Nancy Swanson, both a volunteer and a member of the Board of Trustees, supported the idea that the president of Friends should be an *ex officio* Trustee. This gave the Friends of the Garden immediate acceptance. That name stuck for more than ten years until it became *Volunteers in the Garden* in 1994.

When I became president in 1991, the Garden had 365 volunteers; of these, thirty-

two were charter members of Friends. In 2004 there are more than five hundred volunteers. These charter members were certainly our first "Hardy Perennials," the honor given to those serving ten years or more as a volunteer. This designation began in 1999 and one hundred thirteen qualified at that time with one volunteer starting in 1968.

A record number of volunteers—seventy—took the core course in September 1991. That same year the Volunteer newsletter got a real name, *Gatherings*. Jane Kealy, horticultural aide, submitted the winning name in a contest that drew thirty-three entries. The symbol of the volunteers, an agave cradled in a hand, was designed by Wendy Hodgson and is used on the masthead of *Gatherings* as it was on the earlier newsletter.

The Garden seems to be always under construction as it expands its vision.

My favorite memory of the Desert Botanical Garden is:
Walking the trails, taking photos and pointing out the amazing variety
of cactus to children and grandchildren.
—Betty J. Norrid

The Sonoran Quarterly | AUTUMN
September 2004 | Volume 58, No. 3

Although you can't rearrange a garden like you can the furniture in your living room, re-organizing the visitor's path through the garden and the perception of it became a high priority in the early 1990s. So there was great excitement when word came in October 1992 that the Garden had received \$635,000 from the National Science Foundation to do just that. This was the largest grant in Garden history. Volunteers worked diligently with staff and felt great pride in helping create this outdoor laboratory.

There have been lighter moments for me as a docent. There was the young visitor who thought the crested saguaro was a large broccoli. Or imagine the embarrassment of the young mother when her four-year-old son announced that mom loved margaritas after he heard at one of the touch carts that agaves were a major ingredient of the drink. The only thing worse would have been saying he drank them.

Luminaria—officially called *Las Noches de las Luminarias*—had its origin in December 1978. At first the staff was in charge but

volunteers helped. In 1986 the volunteers assumed primary responsibility; it was "their" event (and grew enormously) until 2003, when the staff once again took over, aided by volunteers. In 1992, we survived the only time that *Luminaria* was rained out, on a Friday night, and cancelled. Carolyn Johnson, the chair

of the event, pulled off something of a miracle with the aid of the many dedicated volunteers who replaced all the rain-soaked bags with newly filled ones; the show went on without a hitch on Saturday. We learned that if you have to do it, it could be done. (An emergency replacing of bags was repeated last December 2003 when a late night storm drenched them after the event concluded for the evening.)

Volunteers work in every aspect and capacity at the Desert Botanical Garden. The staff says the Garden would not be what it is without us. It is true that we have accomplished much. The volunteers remain a vibrant part of a vibrant organization. It is rewarding to say: "I am a Desert Botanical Garden volunteer."

Mary Cochran, a volunteer since 1987, was president of Friends of the Garden (now Volunteers in the Garden) in 1991-93. She currently serves as parliamentarian for the Volunteers in the Garden. Her book, *Fulfilling the Dream: The Story of National Garden Clubs, Inc.*, has been recently published.



Mary Cochran, top row third from left, with a group of docents in 1996.



A class of graduating docents.

Photograph by Ross Conner

Photograph DBG Library Archive



GARDEN NEWS

The Sonoran Quarterly | AUTUMN
September 2004 | Volume 58, No. 3

Learn about desert holes at CultureFest

November 12, 2004 / 9-11:30 a.m. and 2-4:30 p.m. at the Garden



The Smithsonian Institution has selected Phoenix and Scottsdale as the nation's 2004 art and culture destination. CultureFest is a unique celebration of all things cultural, brought to life with performances, discussions and special events for the whole family. This cultural weekend, November 12-14, combines the magic of the Smithsonian with the treasures found only in Arizona, Phoenix and Scottsdale.

Join Smithsonian expert Pinau Merlin, naturalist and author of *The Field Guide to Desert Holes*, on Friday, November 12, for "Tunnel Vision" which includes a slide show and nature walk through the Desert Botanical Garden. Ms. Merlin will discuss the wide diversity of animals that make holes in the desert. Discover why packrats gather all that debris, why kit foxes live in dens all year round, why tiny holes suddenly appear under your palo verde tree and how you can tell a coyote digging from a badger hole. Space is limited. For reservations and information call the South Mountain information and registration line at 602-495-0222.

Ms. Merlin is a naturalist who has

lived in the desert southwest for thirty years and in wilderness areas for fourteen years, studying the wildlife and natural history of this unique area. She is the author of several books and numerous articles about the natural history of the Sonoran Desert region. Ms. Merlin organizes and manages the Institute of Tropical Ecology held in Alamos, Sonora, Mexico, and leads other natural history field trips and expeditions in the southwest, Mexico and Central America. She has also designed natural history museums, interpretive exhibits, nature trails and wildlife habitats for a variety of organizations in the southwest.

CultureFest is coordinated by The Smithsonian Associates (TSA). Established more than thirty years ago as the membership, cultural and educational arm of the Smithsonian Institution, TSA is recognized as the world's largest, most-esteemed, museum-based continuing education and study tour program. CultureFest is produced and sponsored by *Smithsonian Magazine* with the Arizona Office of Tourism, the Greater Phoenix Convention & Visitors Bureau and the Scottsdale Convention & Visitors Bureau.

Cactus scientist joins research staff



Photograph by J. Mark Porter

Dr. Charles A. Butterworth, a botanist specializing in studies of cacti, joins the staff of the Desert Botanical Garden on September 1. Dr. Butterworth's position at the Garden is part of a joint appointment with Arizona State University, where he will also teach courses in the School of Life Sciences.

Dr. Butterworth uses studies of DNA in cacti to investigate evolutionary relationships among different species of cacti. His expertise in this area will contribute significantly to the breadth of research conducted at the Garden.

Dr. Butterworth received his doctorate from Iowa State University in 2003 under the direction of Dr. Robert Wallace, a leader in cactus research. Preceding his doctoral work in the United States, Dr. Butterworth received diverse training in horticulture, environmental science and ecology, botany and soil science from universities in England and Scotland, including the Royal Botanic Gardens, Kew. All of the rich experience he brings with him will be an asset to the Desert Botanical Garden.

Register Now for the Desert Landscaper School at the Desert Botanical Garden

September 21 - May 16, 2005

The thirty-week school program provides practical, hands-on learning experiences in landscaping and horticulture topics.

The program is offered in English and Spanish.

For more information visit www.dbg.org and click on the Desert Landscaper School link or call 480-481-8161.

DBG hires propagator

The Desert Botanical Garden's propagation program was officially revived in December 2003 when Ashly Trask joined the staff as propagator.

Ashly is already implementing a plant introduction program at the Garden. All of her propagation work will enhance the Garden's living collection and Garden plant sales.

Ashly, who has loved plants all her life and worked with them since she was a child, had been employed in the Arizona State University greenhouse operation since moving to Arizona from Brooklyn in 1999.

She is certified as a Maricopa County Master Gardener, an Arizona Nursery Professional through the Arizona Nursery Association, and as a Certified Desert Landscaper through the Desert Botanical Garden. She also has certifications in "Project Learning Tree," "Project Food, Land and People," and



Ashly Trask in Garden greenhouse.

Photograph by Renee Immel

"Project Water Education for Teachers," which are eight-hour-workshop certification programs sponsored by the Arizona Game & Fish Department. She is a member of the International Plant Propagators Society and the American Horticultural Therapy Association, of which she is the secretary.

The Fairchild Challenge: Young adults in pursuit of knowledge

What do botanical art, political cartoons, rap songs and public service announcements have in common? Answer: The Garden's high school environmental education program.

Starting this fall, these topics, along with a few others, are the venues that high school students will use to share what they have learned about environmental science as they compete in the Fairchild Challenge.

Each year, the Fairchild Challenge, named after the famous botanist David Fairchild, focuses on a current environmental issue. This year the focus is habitat fragmentation and loss, an issue that is critical in the Valley as the population continues to surge.

The Fairchild Challenge engages high school students in scientific study through interdisciplinary studies such as art, social studies, language arts, math, and technology. Nine unique "challenges" will be given to high schools at the start of the 2004-05 school year. The students at each high school will complete projects to be entered in a school competition. Finalists from each school will be submitted to the Garden and members of the community who have expertise in each venue will select the best five entries. Students earn recognition awards and points which, when added with other students' points from the same school, generate a school score. The school with the most points receives a \$1,000 environmental education grant while the four runners-up receive \$500 each.

The program's proven three-year track record is evident at the Fairchild Tropical Botanical Garden in Miami, Florida, where the program was initiated and continues to grow.

If you are involved in high school education and are interested in joining this year's Challenge, please contact Tony Ingham, school programs coordinator, at 480-481-8168 or at tingham@dbg.org. For more information on the Fairchild Challenge at the Garden, go to www.dbg.org and click on School Programs.

FALL PLANT SALE FESTIVAL October 15, 16, and 17

*Garden Members' Preview: Friday / 7 a.m.-5 p.m.
Open to public: Saturday / 7 a.m.-5 p.m. and
Sunday / 9 a.m.-5 p.m.*

The Desert Botanical Garden Plant Sale Festival is a one-stop shopping experience for desert-adapted plants. Garden volunteers and horticulturists answer questions and assist in plant selections. There will be a used book sale with a wide variety of subjects.

(Book donations for the sale are accepted at Garden Admissions. Please, no magazines.) There is no admission charge to enter the Plant Sale. Garden members receive a 10% discount on plant purchases only.

Please note new hours Friday and Saturday.

Sponsored, in part, by Tierra Madre Landscape Services, Inc.



Photograph by Renee Immel



N APPRECIATION

The Sonoran Quarterly | AUTUMN
September 2004 | Volume 58, No. 3

The Desert Botanical Garden is grateful for the support of all 14,323 members. Recognized here are members of the Founder's Circle, President's Club, Director's Circle, Curator's Circle, Saguaro Society, and The Sonoran Circle. Also listed are donations and memberships received from March 16 to June 15, 2004, for the Ocotillo Club, Boojum Club, Agave Century Club and Desert Council.

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Carol Schatt

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Susan & Bryan Albue
Becky & Kenneth Allison
Gwynne & Jeffrey Anderson
Patricia & William Andrew
Jeanne Archer
Billie Jane Baguley
David Barnett
Uta M. Behrens
Joy & Howard Berlin
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Betty & Herbert Bool
Oonagh & John Boppart
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Gail Bradley
Dorothy Bramhall
Desiree & Franklin Brewer
Nancy & Charles Brickman
Vivian & Marlon Buchholtz
Mona & Ray Buse
Beth Byrnes & Barton Faber
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Kate & LeRoy Ellison
Constance Estes
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Holly Faubel & David Sprague
Betty & Bert Feingold
Rebecca Ailes-Fine & Peter Fine
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Lori & Howard Hirsch
Meghan & Jerome Hirsch
Kathleen & Charles Holland
Colleen & Steve Hook
Ruth Ann & Thomas Hornaday
Janice & Gordon Hunt
Martha & Ray Hunter
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Sue & Glenn Melton
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Cynthia & John Millikin
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Mary Kay & William Post
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Nancy & Frank Russell
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Marilyn & Jon Shomer
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Bruce C. Thoeny
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Liisa & William Wilder
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Kathleen & Robert Winder
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Annie & Michael Woods
Sylvia & Carl Yoder
Shelia & David Young
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Calendar of Special Events

Mariposa Monarca Exhibit

October 1 — November 7

Fall Plant Sale Festival

October 15, 16 & 17

Music in the Garden Concert Series

Friday Evenings, October 1 — November 12



Photograph by Adam Rodriguez

New World Harvest Festivals

Monarch Butterfly Celebration

October 2 & 3

Gourds Galore! Festival

October 9 & 10

The Great Pumpkin Festival

October 23 & 24

Día de los Muertos Celebration

October 30 & 31

Native American Recognition Days

November 6 & 7

Chiles and Chocolate Festival

November 13 & 14



Photograph by Charles Cobeen



Photograph by Gene Almendinger

NEW THIS FALL!

Experience wines from around the world at the Desert Botanical Garden. Wine tastings and sales are available at the concerts and at New World Harvest festivals for an additional charge.



The Sonoran Quarterly

Desert Botanical Garden

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The mission of the Desert Botanical Garden:

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.

THE SONORAN QUARTERLY

For members and friends of the Desert Botanical Garden, Phoenix, Arizona December 2004/Volume 58, No. 4



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THE SONORAN QUARTERLY

December 2004
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History Isn't Over

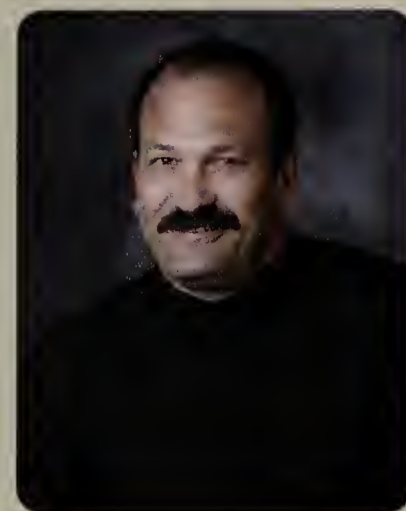
This last issue of *The Sonoran Quarterly* for 2004 represents the close of the Garden's 65th anniversary celebration, with all the wonderful memories that have filled our pages this year. Unlike the year 2004, however, the Garden's history isn't over. In fact it is being made every day—in both a literal and figurative sense—as the Garden's board, staff and volunteers are immersed in a comprehensive strategic planning process that will chart our course for the next ten years.

That process has really just begun, so the ideas I share with you here could change considerably by the time the plan is finished. I want you to know, however, what we are contemplating and, just as important, to invite you to share your ideas with me.

In thinking about our future, it is important to remember how we've grown. In the early years the Garden's primary focus was on assembling in one place a world-class collection of desert plants. That effort began in 1940 with a collecting trip to Baja California, but it wasn't until the late 1960s that the Garden's plant collection reached "critical mass" and achieved international prominence.

In the 1970s and building on the strength of its plant collection, the Desert Botanical Garden initiated its first program of scholarly research when renowned botanist Howard Scott Gentry joined the staff. Dr. Gentry's book, *Agaves of Continental North America*, was published in 1982 and remains the definitive reference on that plant group. Many other distinguished botanists have since studied and published while at the Garden.

By 1990, with its reputation as an academic research center firmly established, the Desert Botanical Garden began to implement a broad array of programs and services for school children, teachers, and other visitors to the Garden. Innovative and award-winning educational programs were added throughout the 1990s, and the Garden ended the decade widely recognized as having one of the best interpretive programs in the nation.



Photograph by Adam Rodriguez

And so the Garden entered the new millennium supported by these three pillars of institutional excellence: a world-class collection of desert plants; a cadre of internationally renowned scientists; and outstanding education programs that were being replicated at other gardens throughout the nation.

By 2000, what we needed was to transform the Garden's infrastructure to a level that was worthy of the world-class plant collection, research studies and education programs housed here. Through the enormously successful "Growing a Legacy for Generations" campaign, more than \$17 million was raised by the Garden for major capital improvements, including a new research, collections and horticulture building; two new education buildings; a conference center; and vastly expanded plazas and other amenities for visitors. These facilities opened in 2002.

Now we find ourselves poised to achieve a new level of excellence. All the necessary elements are in place, and the challenge before us is to imagine what the Garden can be like in the year 2015. In dreaming about these possibilities, we have focused on three areas:

Renewing and improving the existing Garden trails and desert plant exhibits.

Implicit in this goal is the notion that the Garden will not expand by building another campus outside of Papago Park. Also implicit is the expectation that we



A new dawn at the Desert Botanical Garden.

Photograph by Charlie Cobeen

will not create major new trails at the existing Garden; rather we will focus on updating and constantly improving the five major trails we now have. In some cases these renovations would be barely perceptible to the casual visitor; in other cases, sections of existing trails could be redesigned, replanted, and dramatically transformed.



Photograph by Charlie Cobeen

The new Garden entry spiral and admissions area.

Becoming the world's authority on plants of the Sonoran Desert and a primary center for studies of all arid environments.

Implicit in this goal is the recognition of the strength of our current research and horticulture staff, as well as the potential offered by our newly established partnership with Arizona State University. We imagine that in 2015 the Desert Botanical Garden's research program will have grown tremendously and that our botanists, ecologists, and plant geneticists will each be leaders in their respective fields, and together they will be at the forefront of the effort to preserve and protect Arizona's native plants and unique natural heritage.

Positioning the Desert Botanical Garden as Phoenix's focal point for learning about, exploring, and preserving all that comprises the "desert experience."

It is widely acknowledged that the Garden's existing school programs are outstanding, yet they are experienced by a relatively small number of students each year. We envision that by 2105, the Garden's educators and the messages they present will, in some way, reach every student in every classroom in Maricopa County. Likewise we want the Garden's informal education programs to be accessible to and used by our entire community, in as many languages as required. An entire School of the Desert Botanical Garden may actually be created, encompassing the current Desert Landscaper Certificate Program, the new certificate program for Botanical Art and Illustration, and perhaps a new certificate program for Horticultural Therapy.

The specific ideas listed here represent the starting point for our planning. As we enter 2005 and as our ideas grow, I will share them with you in this column. In the meantime, if there are ideas you'd like to have considered as part of the planning process, please send me your thoughts at kschutz@dbg.org. ☀

Ken Schutz

The Dr. William Huizingh Executive Director

CONTENTS

The Sonoran Quarterly | WINTER
December 2004 | Volume 58, No. 4

ARTICLES

- | | |
|---|----|
| A new program teaches botanical art and illustration | 4 |
| Scientists study the on-going drought | 8 |
| ABCs of plant adaptations | 10 |
| The Garden's own weather | 12 |
| 65th Year: Luminaria, trips, Dinner on the Desert | 14 |
| Cactus specialist, Charles Butterworth | 16 |
| Kara Butterworth | 17 |
| <i>Opuntia xandersoni</i> , prickly pear named after Dr. Ted Anderson | 17 |

FEATURES

- | | |
|------------------------------------|----|
| Desert Journal: History Isn't Over | 2 |
| Someone to Know: Tony Ingham | 13 |
| In Appreciation | 18 |
| Calendar of Special Events | 20 |

ON OUR COVER

Webster Auditorium is dressed up for *Las Noches de las Luminarias*, the Garden's holiday tradition. Now in its 27th year, *Luminaria* has been expanded to seventeen evenings and runs November 26–December 23.

Photograph by Adam Rodriguez
adamsphoto@cox.net

A new botanical art and illustration

By Marilyn Garber, Director, Desert Botanical Garden Botanical Art & Illustration Program

The Desert Botanical Garden is proud to offer a new program to teach artist-students the art of botanical illustration. Registrants may study classes of interest to them, or they may enroll in a course of study that will lead to a Certificate of Botanical Art and Illustration.

The Botanical Art and Illustration Program is a serious academic program that provides students the opportunity to learn through structured technique-based

capability as well as to develop the eye and the hand of the artist to create accurate yet aesthetically pleasing work. Students will learn about the conservation of desert plants of the world with emphasis on those in the Southwestern United States.

The Botanical Art and Illustration Program offers a broad range of classes in drawing and painting realistic plant portraits in a variety of media, as well as classes on the science of botanical art. The intention of the program is to provide students with comprehensive courses organized in a skill-building learning path. Workshops by visiting master artists will enhance the learning experience.

Students are welcome to take classes whether or not they register for the certification program. Beginning artists are encouraged to enroll. The coursework and programming is designed for both experienced artists as well as those with no experience.

The program offers a friendly, encouraging environment that will guide students in developing their talents. And the Desert Botanical Garden provides remarkable surroundings to learn to be a botanical artist!

Enrollment Procedures: Certificate students begin the admission process by submitting the application form with a \$35-per class fee (the \$35 is a deposit toward each class, which applies toward the tuition/class cost).

Tuition: The cost for each five-week class is \$172 for Garden members and \$215 for non-members. Certificate students must remit a deposit of \$35 per class with the enrollment form, which is applied to the class fee (as noted in enrollment procedures). Refunds will be given if students withdraw fourteen or more days prior to the start of a class.

Classes begin March 13, 2005. Each class is five weeks in length and comprises one session. Six sessions run through August 20. Registration will begin on January 3, 2005. To receive a certificate program manual or for more information, please contact Eric Garton at 480-481-8164.



Illustration by Jane Ann Schowengerdt

art classes while remaining deeply steeped in the rich tradition of botanical art.

The goal of the program is to stimulate and challenge—to help students achieve a high degree of technical

program begins at the Garden

For students who wish to receive a certificate in Botanical Art and Illustration:

A limited number of students will be admitted to the Certificate Program.

Certificate in Botanical Art and Illustration

The certificate program offers a concentrated study in the specialization of botanical art and illustration. The program teaches the skills needed to illustrate plant specimens accurately. The certificate will be awarded upon completion of twelve required courses, four elective courses, an independent study project, and portfolio review.

Required Courses:

Drawing I
Drawing II
Color Theory
Watercolor I
Watercolor II
Colored Pencil I
Colored Pencil II
Pen and Ink I
Pen and Ink II
Composition
Botany for Artists
Latin for Artists

Elective Courses (sample)

National Collection Species I
National Collection Species II
Seed Heads and Pods
Carbon Dust Illustration
Pollinators - Insects I and II
Pollinators - Birds I and II
Studio Class - Drawing
Studio Class - Watercolor
Botany for Artists II
Creating Form
History of Botanical Art

Independent Study Project

The independent study project incorporates illustrating the plants of the Living Collection of the Desert Botanical Garden. Paintings will be available for research and display. This project offers the advanced student an opportunity to participate in a significant documentation project.

Workshops

Workshops by master artists will expose students to the techniques of some of the best artists working in the field. Students enrolled in the certificate program will receive priority placement.

Portfolio Review

Students will compile a portfolio of work that will serve to record their growth and achievements. A panel of instructors will review the portfolio and the certificate will be awarded based on the quality of work. Students will be encouraged to repeat classes in areas that may need improvement.

Completion of the program requires two years if the student takes one class per session. Students must declare participation in the certificate program by completing an enrollment form by February 28, 2005. Certificate students must take classes in a sequence as determined by prerequisites.

Classes begin March 13, 2005. Registrations will begin on January 3, 2005. To receive a certificate program manual, contact Eric Garton at 480-481-8164.



Illustration by Lynn Reves

Learning art in the context of science... and science through an artist's eyes

About our mission:

The Botanical Art and Illustration Program is dedicated to combining art and science to further the understanding and knowledge of desert plants through structured, technique-based art classes and exhibits of botanical art.

The dilemma for the botanical artist immediately becomes apparent. Since accuracy—scientific accuracy—is so basic to the art of botanical illustration, where is there room for art? Can art and science be combined? Or must we choose between these two disciplines?

Wilfrid Blunt, in his definitive study *The Art of Botanical Illustration*, has this to say about the problem of choice between science and art that faces the botanical artist: "The botanical artist finds himself at once and always in a dilemma: Is he the servant of Science, or of Art? There can, I think, be no doubt that he must learn to serve both masters."

The Botanical Art and Illustration Program at the Desert Botanical Garden has been designed to reach the ideal goal of serving both science and art. Courses instruct in how to observe, how to reproduce, and how to paint; all are based on a firm understanding of the life and limb of the living object, its structure, its place in the plant kingdom, its place in the larger environmental scene. Thus, botanical illustration offers the opportunity to enjoy a true union of two great disciplines. The greatest masters have met the needs of science but also produced aesthetic masterpieces. As Wilfrid Blunt concludes, "The greatest flower painters are those who have understood plants scientifically, but have yet seen and described them with the eyes and the hand of the artist."

Illustration by Lynn Reves

About botanical art and illustration:

H. Walter Lack, in his *Garden Eden: Masterpieces of Botanical Illustration*, states clearly and simply the basic premise upon which successful botanical illustration must rest. He writes: "The purpose of every botanical illustration is to give an exact picture of a plant or of parts of a plant. It is essential to capture the often short lived and fragile structure of a plant so precisely that the observer is able to identify and recognize the plant."

About Marilyn Garber:

Marilyn Garber, director of the Botanical Art and Illustration Program at the Desert Botanical Garden, is a botanical artist and educator. Her work has been exhibited at the Royal Horticultural Society in London, the Smithsonian Tropical Research Institute in Panama City, Panama; the Brooklyn Botanical Gardens and the Arsenal Gallery in New York City, the Minnesota Science Museum, The Bakken Museum in Minnesota, as well as many other



institutions. She is an invitational member of the prestigious Brooklyn Botanic Garden Florilegium Society and founder of the Minnesota School of Botanical Art that was established in 2001. She is on the board of directors of the American Society of Botanical Artists, serving as its vice president and co-chairing its education committee.

An article in the *Northern Gardener* magazine said:

"As a child, Marilyn Garber loved to meander through the undulating grasses and wildflowers that flourished in an undisturbed section of prairie on the Iowa farm where she grew up. She was charmed and fascinated by the way vegetation changed through the seasons. However, instead of digging the plants and taking them home to uncertain fate, she began drawing them with botanically correct detail.

"Today Garber is the founding director of the Minnesota School of Botanical Art located at The Bakken Museum in Minneapolis. There she continues the tradition of artists from earlier centuries who understood the structure of plants and presented their knowledge aesthetically. 'Botanical art is a blend of science and art, capturing the beauty of the plant while including the characteristics that help to identify the specimen,' says Garber. Her aim is to teach students the technical skills to continue this long-held tradition."



Illustration by Melanie Schane

About Catherine Sawner, lead instructor:

Catherine Sawner is an artist, botanical illustrator, and art educator. Upon moving to the Sonoran Desert, she became fascinated with the complex patterns of light and shadow on natural objects, especially desert cacti, which she portrays in mixed-media paintings. Her work has been shown locally and nationally in gallery and juried



Illustration by Lynn Reeves



Illustration by Kat Brown

exhibitions. She has many published illustrations to her credit, including the Desert Botanical Garden's award-winning "Desert Discovery Trail Guide." Catherine has been a volunteer and taught botanical art classes at the Desert Botanical Garden for twelve years. She has an unshakable faith in all her students and takes delight in helping them achieve their artistic goals. ■

It's even drier in this dry land



Dr. Erik Hamerlynck of Rutgers University (left) and Dr. Joe McAuliffe in April 2004 at Joshua Tree National Park amid creosotebush and white bursage plants killed by the extreme drought.

...scientists study the on-going drought

By Joe McAuliffe, Ph.D., Director of Research

Severe drought continues to grip much of the western United States, including the deserts of the Southwest. This summer's monsoon season gave a lackluster performance; most Arizona locations received half or less of the average expected amounts of rainfall during July and August. Moisture derived from Pacific hurricane Javier brought some of the most significant rainfall to the region in mid-September. This storm system, however, did little to alleviate the extreme moisture deficit that has developed since the late 1990s.

Consequences of this drought are reported with increasing frequency in the news. Lake Powell on the Colorado River has never been at a lower level. The lake currently holds less than forty-five percent of the volume it was intended to store, and that amount is steadily diminishing. Downstream, the shoreline of Lake Mead also has dropped

to record low levels. Receding water levels of reservoirs on the Salt and Verde rivers in Arizona increasingly raise concerns about the supply of water to the growing urban population of central Arizona.

Will this drought end soon, or will it continue? At the present, it is impossible to answer this question with any degree of certainty. From the late 1970s through 1998, the southwestern United States experienced a time of unusually abundant precipitation. This moist climatic interval was in large part the doing of frequently recurring *El Niño* conditions in the Pacific. The *El Niño* phenomenon involves a weakening of the westward-blowing equatorial winds and a concomitant movement of relatively warm surface waters to the east toward the coast of South America. During an *El Niño*, the warmer surface waters in the eastern Pacific yield more water vapor to the atmosphere and some of this moisture

eventually reaches desert regions of the southwestern United States. The last relatively strong *El Niño* occurred in 1997-1998.

The drought, now in its sixth year, has been the cause of widespread death of plants across both the Sonoran and Mojave deserts of southern Arizona and California. Last year (*The Sonoran Quarterly*, December 2003) I reported on how several colleagues and I are studying the impacts of the drought on native desert vegetation throughout this wide area. From February to April, 2004, we re-examined sites that we initially established in 2003 and collected data on the condition of vegetation. As expected, there has been little establishment of new plants due to the continued rainfall shortages. In some places, especially

future. The study sites we established in 2003 provide an invaluable baseline for tracking these changes into the future. The information we will continue to gather will allow us to better understand the kinds of changes that may occur.

After our field research in spring 2004, Drs. Erik Hamerlynck and Claus Holzapfel, both of Rutgers University, joined me in preparing a research proposal that was

native perennials. These non-natives could exert a significant competitive effect that may inhibit future establishment and survival of young native species.

The different types of research expertise each of us has to offer will contribute to a



Dead, leafless remains of the small shrub, triangleleaf bursage on a gentle slope at Organ Pipe Cactus National Monument.

in the southern Mojave Desert of California at Joshua Tree National Park, the extreme mortality rates among desert shrubs we observed in spring 2003 only worsened. At one site, one-third of all creosotebush plants had died between 2002 and 2003. By spring, 2004, half of all creosotebush plants were dead.

My colleagues and I recognized that this drought represents one of the most widespread and severe natural disturbances to have impacted these environments in historical times. The widespread mortality of long-lived desert plants like creosotebush (*Larria tridentata*) and bursage (*Ambrosia deltoidea* and *A. dumosa*) could affect the composition of some desert plant communities for many decades or even a century or more into the



One of the very few triangleleaf bursage seedlings at Organ Pipe Cactus National Monument that established in the winter season of 2003-2004 beneath the remains of a dead, adult plant.

submitted to the National Science Foundation. The proposal requests funding for three years in order to continue the research on ecological changes in desert vegetation at five sites hard-hit by drought in southern Arizona and California. The project also will investigate factors that either limit or contribute to post-drought recovery of vegetation. These factors include variation in precipitation, soil characteristics, and the potential influence of competition from non-native ephemeral plants. At some of the sites we studied, there was a surge in the abundance of non-native ephemerals in the aftermath of widespread mortality of



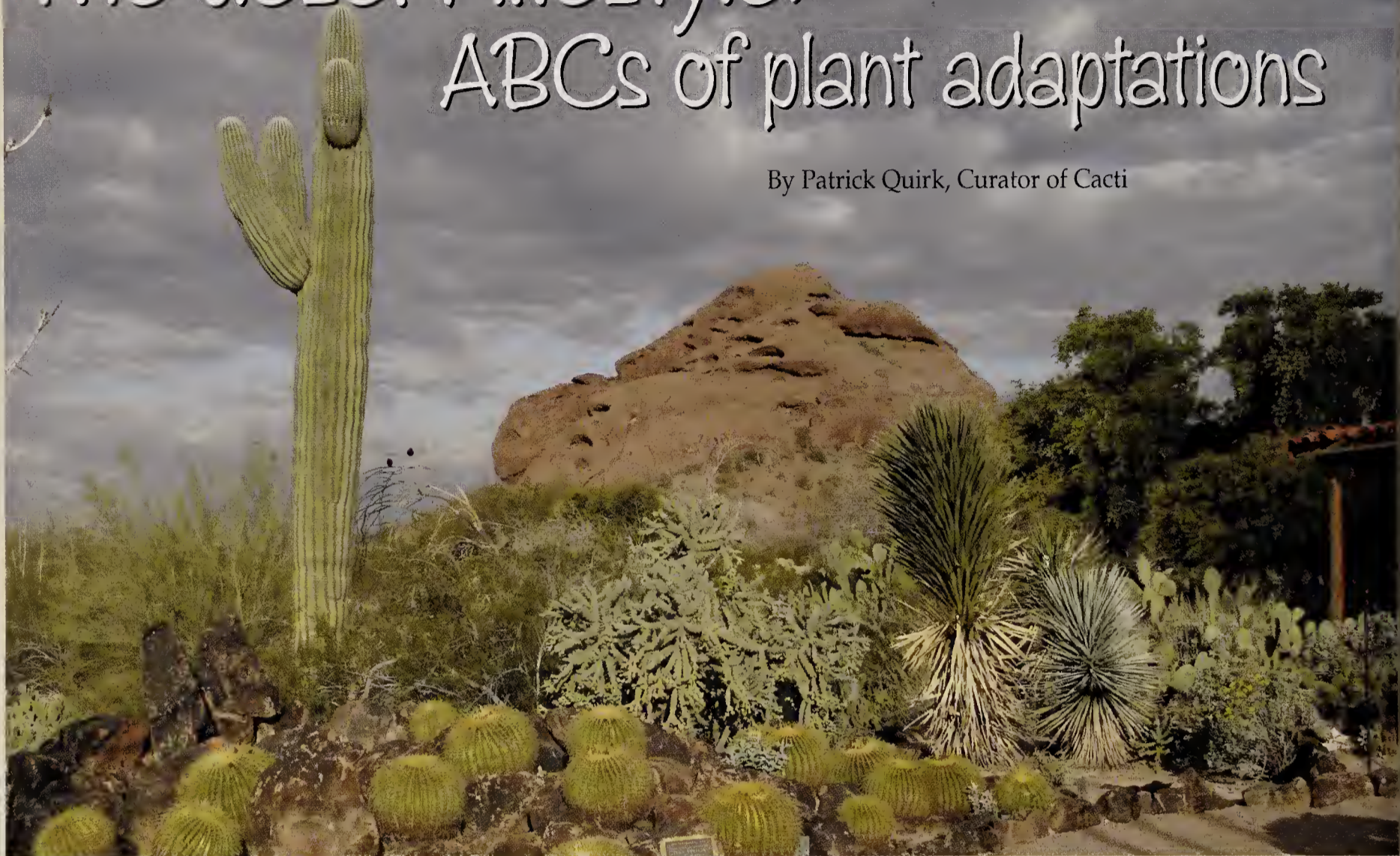
A dense, straw-colored drop of a non-native ephemeral, Arabian grass, *Schismus arabicus*, at Joshua Tree National Park in April, 2004. It is possible that this non-native species could inhibit re-establishment of some native perennial plants.

thorough analysis of factors affecting future change in the affected plant communities. Dr. Hamerlynck is a physiological ecologist who studies water stress in plants. His studies contribute to an understanding of soil moisture levels required for vegetation recovery. Dr. Holzapfel has conducted innovative field experiments showing how non-native ephemeral plants compete with native perennials in deserts. Similar types of field experiments will be used to examine these types of impacts at our study area. I will be responsible for the study of plant population changes, including the monitoring of seedling establishment and plant survival in the future.

With the baseline data we have already amassed, we are poised to make significant contributions to knowledge about how climatic extremes affect plant communities in both the Sonoran and Mojave deserts. ☀

The desert lifestyle: ABCs of plant adaptations

By Patrick Quirk, Curator of Cacti



Desert life is a tough life. Rainfall is almost always on the short side and is rarely reliable or predictable. Temperatures can be very high, very low, or both; strong, drying winds are common. These factors limit the amount of water available to all life forms in the desert. Plants are at an especial disadvantage. Animals can seek out available water, even migrate if necessary, but the plants must stay, bearing up under the stresses of drought until either the next rain comes or they die. So, how do they survive?

Desert plants have developed some interesting survival techniques. We will consider here how each of the principal plant structures —leaves, stems, and roots— change from their basic simple forms, found in wet areas, to the often “weird” forms and shapes they take on in the deserts.

In humid areas of the world, most leaves are broad and thin. This allows the leaf to

devote the maximum surface area to its principal purpose, which is to gather as much light as possible. To cool itself from all this light exposure, a thin blade full of pores that release cooling water is best.

In the desert, however, such a leaf would soon be sucked dry of all its water by the constantly dry and often warm air. Desert leaves need different shapes. Because a smaller surface exposes less area to drying air, nearly all desert plants have reduced the sizes of individual leaves to cut water loss. This also gives a plant more adaptability; in wet weather it can put out more leaves, in dry times it can drop all or nearly all its leaves until the next rain. Many desert plants have adopted this leaf-drop strategy; it is comparable to autumn leaf drop in northern climes.

Desert leaves have some other tricks as well. They often are coated with material that resists desiccation. Some put on layers



Photograph by Adam Rodriguez



Photograph by Charles Cobeen

of wax to reduce evaporation, others cover themselves with hairs, usually white or gray, to shade the leaf from excess sun.

Succulence—storing water in leaves or stems—is another strategy that can provide a reservoir of water and can help cool the leaf. Succulence is a good strategy against drought, but is not always effective against heat.

Finally, most desert leaves have fewer pores, or stomata, which reduces the amount of water lost through the pores.

All these adaptations come at a price, and that price is reduced productivity. These adaptations result in fewer stomata, which allows less carbon dioxide to enter the leaf, which allows for less food production, thereby slowing growth. Slower growth is better than death, however, and these adaptations persist.

Stems in plants usually serve to hold the plant up and provide scaffolding for leaves. Like the pipes in household plumbing, they also move water and food around the plant and provide storage for food. In desert plants, however, they can acquire a few more chores. In many plants, the stems include chlorophyll in their surface cells, allowing the stems to manufacture food, a function usually reserved for leaves. This allows the plant to shed all of its leaves and still be able to feed itself.

The main adaptation of desert stems is that of being succulent, for which the cactus family is famous. (Not all spiny succulents, however, are cacti.)

Most stem succulents have a wax coating, often of a blue hue. Again, the reduced number of stomata present in

the stems of woody or succulent desert plants slows potential growth.

Many plants have decided that a good place for their stems is underground, which greatly slows drying. Beneath the soil surface is a good environment for



Photograph by Gene Almerding

food storage, and many plants, such as the Arizona Queen of the Night, form tubers for that purpose.

Root adaptations are much different. Of all the elements in a plant's environment, the underground is the least changeable and the slowest to dry out, so roots are conservative in their structures, differing little from those in wetter areas.

One adaptation desert plants do use is placement of their roots. Some roots grow deep, like grasses. Australian desert plants are typical of this; their deserts mostly resemble big sandboxes into which rain infiltrates quickly and deeply. You can see this deep rooting in all sandy areas in our desert, too, including the Yuma sands.

Other plants grow their roots near the surface of the soil. This is the pattern especially in

areas with a lot of rock and caliche, where deep penetration by rainwater is difficult. These roots can capture water from even light rains that may penetrate only an inch. Deep rooted and shallow rooted plants can live harmoniously since they do not compete for water in the same space.

Water is drawn into roots largely because the root interior is drier than the soil, and water moves from wetter places to drier places. In deserts, it often happens that the soil is drier than the roots, so, one may wonder, what keeps the water from flowing out of the root to the soil? What happens here is that the roots secrete sugars that are soon colonized by fungi and bacteria grateful for the meal. They in turn form a mucilaginous coating on the root. When the soil dries out, the roots shrink, but the coating does not; it creates an air space, making a humid chamber from which the water does not escape; the air space breaks the chain that water molecules habitually form, so the water stays.

There may be other adaptations below ground that we do not know about. It is a mysterious world under the ground; the more we look, the more we learn about the relationships between the residents of the soil and plants. Much of it may turn out to be central to the lives of plants.



Photograph by Charles Cobeen

The Garden's own weather

By Patrick Quirk, Curator of Cacti

One great advantage to gardening the same place for a very long period of time is the intimate knowledge you can get of the place on even the smallest scale. This is especially true of weather. Each season in each year is a little different, and each can teach you a new lesson. Over time, one can become quite sensitive to the varied microclimates of a place, and how these areas respond to the overall climate of a region. I have been gardening this patch of ground for twenty-six and one-half years and in that time I have seen a lot go on. Yet it remains true that I constantly learn or observe something new, something that will serve to make my gardening more successful in keeping these plants alive.

On the grand scale of world climate, we live in one of the hottest, driest places in the world. Central Arizona compares in many ways to Cairo, Baghdad, Riyadh, and Alice Springs. It can be said that the default mode of our weather is hot and dry until further notice. Our local plants, as a consequence, are some pretty tough customers. We are not an "average" habitat, especially for cactuses and succulents; most of those come from habitats that may be equally dry, but cooler.

Locally, the Garden is one of the hottest places in the entire valley. Our daytime highs are routinely higher than those of Sky Harbor Airport and usually match those from the east and far west valley, the other main hot zones. Our plants do not appreciate this. Our lows, in contrast, are fairly average for the Valley but are greatly exceeded by those of the airport.

Interestingly, the airport, because of its vast expanse of pavement, plus the action of the aircraft that in taking off and landing stir up the air layers, is the least representative of all stations of the average weather of the area; it is a world of its own.

I measure the temperatures of the Garden's climate in the main arroyo, which is the low point; the African section, which is the mid-



Photograph by Adam Rodriguez

point; and the butte ramada, the high point. These are collected every day that someone is here and we keep the record sheets.

Within the Garden itself we have a tremendous range of temperatures. During the day readings are relatively the same from point to point, but at night enormous differences can be found at different locations in the Garden. This is caused by cold air drainage.

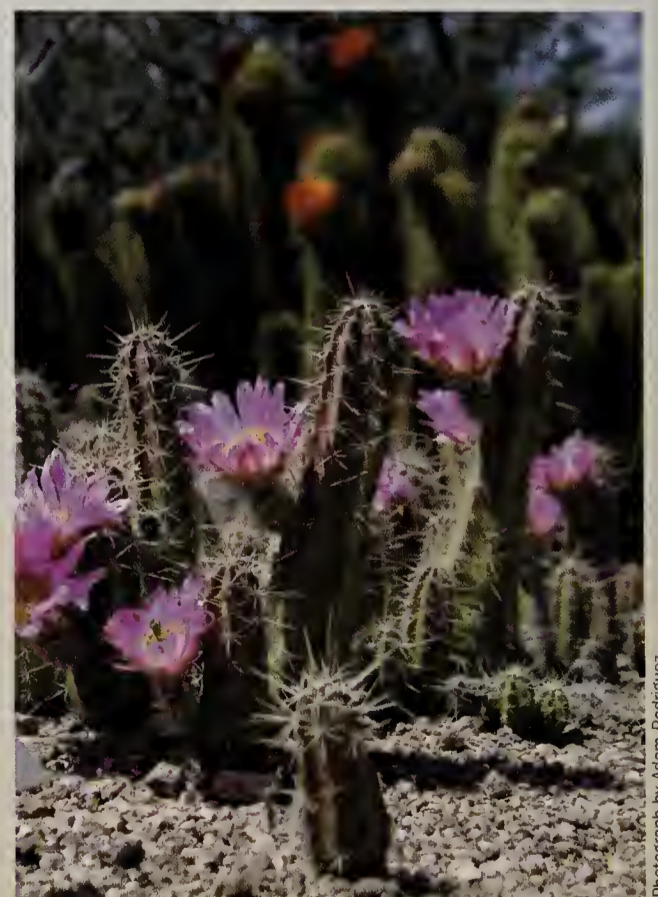
This phenomenon of cold air drainage manifests itself on still nights. Cold air, which is denser than warm air, flows downhill just like water. Soon after dark, the flow of cool air begins off the Creigbaum Butte (behind Webster Auditorium) to settle in the main arroyo. You actually can stand in a minor arroyo and feel the air flow past like cool water. On many nights the difference in temperature between the butte and arroyo can be five degrees, and I have measured a difference of nine degrees more than once. One major lesson this teaches is never to plant frost tender plants in low-lying areas. We have frosts here nearly every winter, usually no more than -2°C . (28 degrees F.), but our worst was -10°C . (14 degrees F.) in 1978, which killed a lot of plants. Our

hottest summer temperature was 50°C . (122 degrees F.) in 1990, a temperature so hot that it created its own wind.

Our records show that it has become warmer here since 1978. Frosts are becoming rarer, which we like, but unfortunately day temperatures are also warmer. The worst change is a great increase in night temperatures that are reaching unprecedented high lows. Once a nighttime low of 90°F . or above was rare, but it now is routine. These temperatures alone can kill many plants adapted to the cool nights of coastal and mountain regions, such as jade plant.

Overall, my weather records show that it was cooler between 1978 and 1986, followed by record high heat from 1987 to 1994, then cooler again from 1995 to 1999, and finally very hot again through now. The trend, as in most all other areas, is inexorably upward.

Helping the plants survive is a matter of using microclimates, choosing the right plant for



Photograph by Adam Rodriguez

the spot, and using shade cloth and frost cloth. There is no way to protect them from generalized warming, however, either here or out in Nature. ☀

Tony Ingham, inspired to teach

By Carol Schatt

When you talk to Tony Ingham, you come away believing the man can do anything.

His entrepreneurial spirit is matched by his fast-talking energy and his enthusiasm for the job at hand.

Tony—first a volunteer, then an intern in the Garden's educational services department, then a seasonal employee—was hired last May as school programs coordinator. His job is to make the Garden's programs for kindergarten-through-college students the best they can be. He is also in charge of the Garden's teacher training programs.

Guided tours for kindergarten through sixth grade groups was the first priority for Tony, with the goal to accommodate up to five tours daily by this fall. In June, Tony worked with docents and education department staff to craft two new tours to add to the roster. Docent-guided tours have long been the staple of the Garden's on-site educational program, but there simply weren't enough docents available to do that many tours.

Summer seemed like a short period of time, but Tony hired and trained seventeen new part-time school guides in that brief window. They started guiding tours in October.

The process took one and a half months. Tony's committee of docents, department personnel, and teachers advertised the job in May and then reviewed the 122 resumes of applicants, selecting fifty-seven to be interviewed. Of twenty-two possible candidates, the team hired seventeen. An intense training course of sixty-five hours combined material from various Garden courses and included topics such as interpretive training, Sonoran Desert ecology, botany, Southwestern natural history, and hands-on games and activities to make these guides ready for any questions from inquisitive K-6 students.

Each guide will work fifteen to twenty hours a week; they augment the work of

twenty-five to thirty SAGES (Sonoran Adventure Guides and Explorers) who also guide school groups through the Garden.

Tony, a native of Detroit and a graduate of Michigan State University, worked for the computer giant Intel for a number of years, from Arizona to Boston to the Far East. His specialty was logistics, including mergers and acquisitions. While in Phoenix, he met and married his wife—who still works for Intel—and when her job moved them back to Phoenix from Boston, he decided he would rather be in education. Spotting a job listing on a local bulletin board for an internship at the Desert Botanical Garden, Tony jumped at the chance to get a toehold in the fields that interested him—biology, botany, and science. He has since completed a Masters degree program in elementary education at the University of Phoenix.

He loves to teach and attract young minds to the fields of science, botany, and ecology. At first he was most interested in high school students, but now it's 4th, 5th, and 6th graders who make him "feel most at home," he said. "They have not yet created perceptual filters. And they ask the hardest

questions! They make you see things in a new way every day."

This fall he completed the planning for 7th and 8th grade onsite ecology labs in which students will observe, map, and study the ecological factors of where plants grow in relationship to water, shade, exposure, and the like. In another portion of the lab work, students will learn how to identify plants using dichotomous keys. Both labs are conducted at the Garden, on public trails as well as over portions of the Garden's preserve lands.

Tony is also directing teacher-training programs in conjunction with Arizona Game & Fish personnel, as well as the pilot Fairchild Challenge project to engage high school students in scientific study on a current environmental issue.

"I just love the Garden," Tony enthusiastically exclaimed, "for the camaraderie, fellowship, and overall great feeling you get working here with these excellent minds and energized staff and volunteers. I love this place for its plants. I love this place for its mission, but most especially I love this place for its people."



Photograph by Renee Immel



My favorite memory of the Desert Botanical Garden is:
My wedding day on March 22, 2003. Then returning to the Garden this
Holiday season to see the luminarias. —Megan Harman

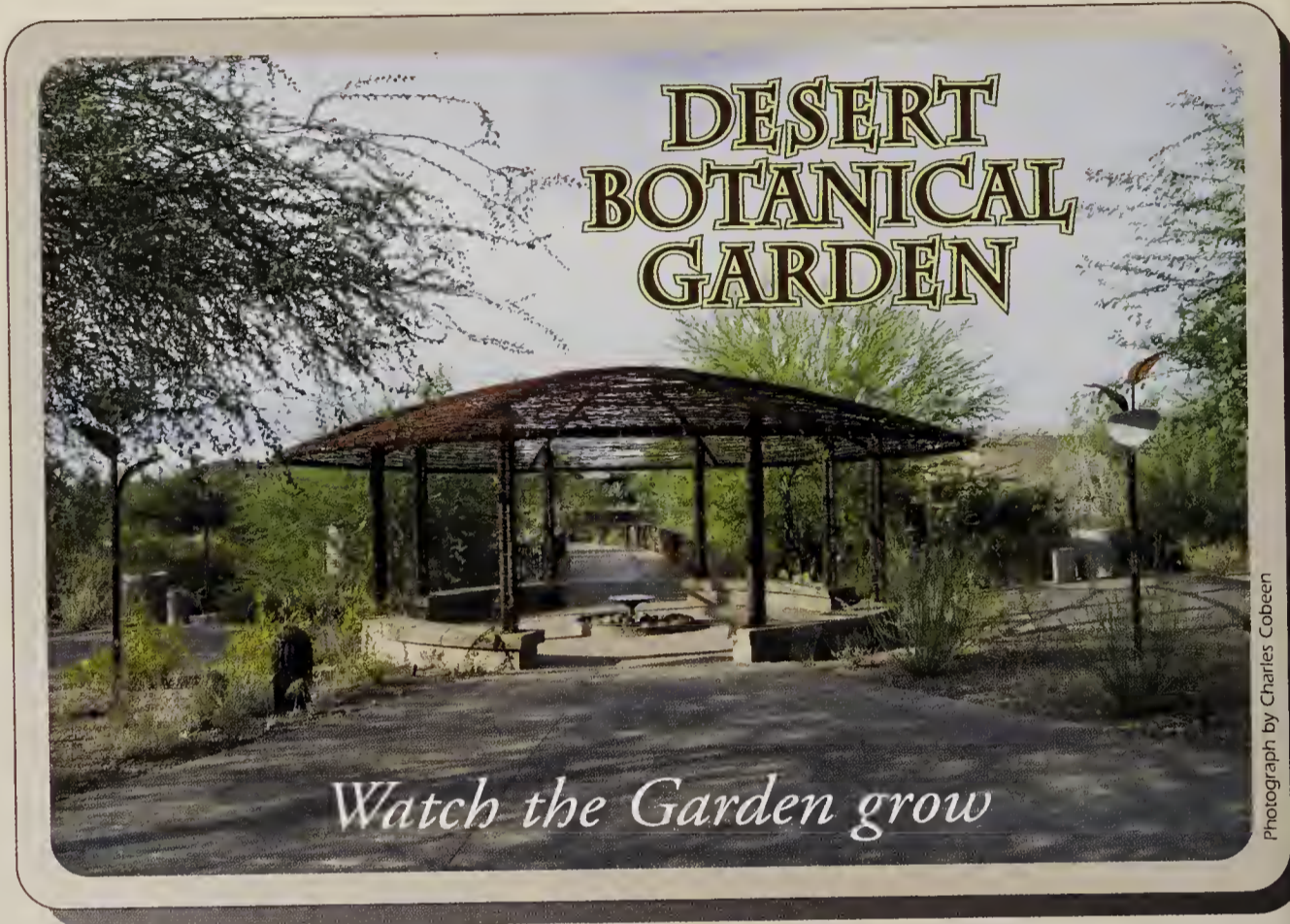
The Sonoran Quarterly | WINTER
December 2004 | Volume 58, No. 4

Luminaria, trips, and Dinner on the Desert

By Nancy Swanson, Desert Botanical Garden Trustee

There were no bell ringers in Webster Auditorium in 1981 at my first *Luminaria*. Instead, colorful paper *piñatas* hung from the big log ceiling *vegas*. Children gathered around jolly St. Nick (Henry Treisler, president of the Board), clamoring to be the first, blind-folded, to try with a long stick to break the *piñata*.

I had read about *piñatas*, but had never seen them. Even the *luminarias*—candles in brown bags—were new to me. We had just moved to the Southwest, and I signed up for docent training at the Desert Botanical Garden to learn about the strange-to-me desert environment. My volunteer job for *Luminaria* night was to make cocoa on a gas stove in a small room off Webster Auditorium and pour it into paper cups to be served on a long Mexican table. The evening was cool with a touch of wind and bit of rain. Dads carried young



Photograph by Charles Cobeen

Schatt entry arbor opened in 2002.



Photograph by Adam Rodriguez

children on their shoulders. Everyone was friendly and grateful for the hot cocoa. I loved the scene and volunteered to do cocoa again.

The morning of the next—the third—*Luminaria*, *The Arizona Republic* ran a story about it AND a photo. The evening turned out to be balmy and beautiful. Crowds of people came—and then more crowds. There was no way two saucepans on gas burners could keep up with the demand! We sent out for more Swiss Miss cocoa mix. We used hot water straight from the tap. We floated marshmallows to mask scanty servings. And we laughed until we cried and everyone got at least a sip of hot cocoa.

Isn't being a volunteer the most special part of the Garden experience? Words

like "unique," "dynamic," "beautiful" (particularly in spirit and temperament) apply to Garden people, staff and volunteers, as well as to the plants and surroundings. Remember Jean Cordts, who as a volunteer kept a record of all the plant flowerings at the Garden; Nancy Rheinlander, who helped with everything (and still will); Mary Bess Mulhollen, who made it all fun; Jane Cole, cheerful and helpful in her library kept cold to preserve the books?

... Other memories of early days? In the 80s, when Garden staff was small, Director Dr. Charles Huckins suggested two ideas to increase membership and visibility—a trip and a fundraiser—and asked me to help.

For the trip we chose to whale watch with International Expeditions along the



My favorite memory of the Desert Botanical Garden is:

Walking in the dark, after one of the jazz concerts, and seeing the suddenly blooming Queen of the Night, lighted by a simple light above it. It was breathtaking.

—Zoltan Gelleri and Maria Salapska

The Sonoran Quarterly | WINTER
December 2004 | Volume 58, No. 4

— all helped the Garden grow

Baja Coast, quickly filled the small, twenty-three person cruiser, and were thus able to schedule trip "extras" such as plant identification excursions and actual fishing for our dinner. Dr. Huckins published a daily "Travels with Charlie" bulletin. Dr. Harry Wood, retired chair of art at Arizona State University, did character sketches of us all. Bill Bombeck's feet swelled so much from sunburn that he couldn't wear shoes for days. The Cottons and the Mitchems kept us playing games. And some trippers told of bonding with whales that swam near their dinghies for hours, as if asking for petting and companionship. Even the reunion months afterward was a delight!

The fundraiser was Dinner on the Desert, and for its first three years was held in Tom Chauncey's Arabian horse barn on Scottsdale Road north of Bell. We volunteers spent days in the muck, preparing the place with clean bales of hay for cocktail décor and elevated tables for dinner and horseshow. The event was scheduled for the second Saturday in November, a date that old-timers said was sure to have great weather. Nancy White, party planner *extraordinaire*, put the gloss on plans



Photograph by Adam Rodriguez



Photograph by Charles Cobeen

Webster Auditorium, a historic building named in honor of the Garden's founder, Gertrude Divine Webster.

that made this event a "must" for Valley social calendars.

Second year table sales were also superb. Suddenly temperatures dropped to freezing! It was the coldest day on record with no way to heat that huge barn! We expected a very small turnout and a short and miserable party. But not so. Phoenicians found treasures from northern climes, long unworn, in the backs of their closets. They came in minks, long down coats, colorful ski outfits, blanket *serapes* from Mexico and long wool kilts. Wine flowed. Spirits soared above the temperatures. It was a wonderful party, as the write-ups with photos on Sunday, illustrated. "Who wore that white ermine jacket and hat? He was dashing!"

Today, when I admire the entry arbor, walk across the bridge, see the grand entrance, the pavilion, the new auditoriums and

offices, it is interesting, almost startling, to recall the days when we plotted to ensure that mail would be delivered to the Garden instead of being left at the McDowell Street station. I remember Charles Merbs, from Arizona State University, saying in strategic planning meetings that "ethnobotany" was a new buzzword among academics, and, later, Ruth Greenhouse coming to me as president of the Garden Board of Trustees with a rough plan for an intriguing ethnobotanical trail.

Many memories, many stories—what a pleasure to watch and help this garden grow! ♦

Nancy Swanson has been a volunteer at the Garden since 1980 and is in her third three-year term as a Trustee. She was president of the Board of Trustees in 1985-86.

Our specialist in cacti will peer at their DNA to unlock their mysteries of kinship

By Carol Schatt

Dr. Charles Butterworth, a molecular systematist who specializes in the study of cacti, is the Garden's new research botanist. He is setting up a new laboratory in one of the two new Anderson Research Lab rooms in the Pulliam Center for Desert Research and Horticulture. Many pieces of highly specialized equipment are needed for the chemical separations, storage, and analysis of DNA. Items with names like thermal cyclers, Dewar flasks for liquid nitrogen, microcentrifuges, vortexers, and spectrophotometers are not the kinds of things you can buy at the local kitchen appliance center or hardware store.

Dr. Butterworth's research with this equipment will help unlock some of the mysteries of how cacti evolved and give a better picture of the kinship relationships among different species. The modern tools of "DNA fingerprinting" offer a powerful way to determine similarities and differences in the unique DNA codes of various species.

This work will add greatly to the breadth of research conducted at the Desert Botanical Garden. It also builds on the work of the Garden's Dr. Edward F. "Ted" Anderson, whose monumental book *The Cactus Family* was published in 2001 just before his sudden death. Dr. Anderson was eminent as a specialist in the systematics and classification of cacti.

"People like Ted and others have given us ninety-five percent of what we know in terms of how cacti are related," Dr. Butterworth said. "Yet there are still many unanswered questions such as what their ancient origins are and how they are related from their ancestors—we will be using modern techniques to investigate those relationships."

When Dr. Butterworth has outfitted his lab with the specialized machinery, including bits and pieces of redundant equipment that have been generously donated by Rancho Santa Ana Gardens in California, he will be doing a lot of "pretty straightforward chemistry, a lot like a cooking recipe," he said. The lab space was a gift from Garden Trustee Hazel Hare, and the



Dr. Butterworth with new lab equipment.

Board of Trustees approved the allocation of \$50,000 in order to outfit it.

To obtain the DNA from a plant, Dr. Butterworth first has to get the plant material. "This can be easier said than done," he said. He extracts the DNA by grinding the material, adding solvents and taking out proteins, ending with a clear solution to which alcohol is added and the DNA comes out a white precipitate. Dissolve that in a suitable buffer—here it goes beyond the ken of ordinary mortals—and then you can begin to look at the DNA sequences, a detailed and sometimes tedious procedure that involves



Visiting with *Echinocactus* in the Tehuacán Valley, Mexico.

amplification, gene copying, graphing and other steps on highly refined equipment.

All that eventually culminates in Dr. Butterworth poring over graphs of gene sequences on a computer screen, noting the differences and figuring out why.

Born in northern England, Charles Butterworth at age 18 wanted to work in horticulture. He was admitted to the highly selective horticultural training program at the Royal Botanical Gardens, Kew, but decided after three years that he "didn't want to be mowing lawns and planting hundreds of thousands of plants in front of city halls." So he headed into science, studying ecology at Stirling University. Deciding he wanted to work with plants he moved to Reading University, one of the largest botany departments in England, and earned a Bachelors (and honors) degree in botany.

For the next four years, he was a botanical consultant for Readers Digest. He wrote sections on cactus and plant identification for the *Readers Digest New Encyclopedia of Garden Plants and Flowers*, published in 1997.

Butterworth then returned to science and research, finding his direction through contacts with Nigel Taylor, a cactus specialist at Kew, as well as three days spent in Mexico visiting with Charles Glass, another cactus specialist. By then fascinated by cacti, he went to Iowa State University where he received his doctorate in 2003 under the direction of Dr. Robert Wallace, a leading cactus researcher.

Following post-doctoral work at Rancho Santa Ana Gardens in California, Dr. Butterworth joined the Garden staff in September. "This is a world-class garden for cacti," he said. "Following these big names (Dr. Anderson and agave specialist Dr. Howard Gentry) makes me a bit nervous. It's a lot to live up to."

Dr. Butterworth's position at the Garden is part of a joint appointment with Arizona State University where he will also teach and guide graduate students. 🌵

Photograph by Charles Cobeen

Photograph by Phil Brewster

Kara Butterworth: getting kids excited about plants

Kara Butterworth reached around behind her desk to turn off the occasional chatter of nine walkie-talkies. "They're for the guides," she explained. "This is the hub."

Her office is indeed the hub. She is "Scheduling Central" for the guided tours booked at the Garden. She schedules the guides for up to five tours a day, calling on the Garden's twenty-five to thirty volunteer guides and the seventeen new guides hired to lead tours.

Kara's job as lead school tour guide in the Garden's Department of Educational Services also means she fills in as a tour guide, conducts the junior high lab, and leads the occasional high school tour. It requires patience, flexibility, cheerfulness, and a "we-can-help-you" attitude.

It's all a part of getting 30,000 school children a year through the Desert Botanical Garden and helping them leave with some good ideas about science, plants, and the desert where we live.

Kara is a botanist with a Bachelors degree in botany from Miami University in Ohio and a Masters degree in botany from Iowa State University. She did botanical research as a part of her degree program at Iowa State, comparing the fibers of wild cotton plants to those of cultivated varieties.

A lover of plants from her earliest childhood in Colorado, Kara is interested in teaching children about plants and getting them excited about careers in botany and the sciences.

She and her husband, Dr. Charles Butterworth, who has joined the Garden's research department, moved to this area in September and are enthusiastically becoming acquainted with the Sonoran Desert and Arizona. ☀



Opuntia xandersoni A new prickly-pear named after Dr. Ted Anderson

By Raul Puente, Curator of Living Collection

A new prickly pear has been recently described and named in honor of the late Dr. Edward "Ted" Anderson.

Dr. Anderson was the cactus specialist at the Desert Botanical Garden from October 1992 to 2001. While at the garden he authored numerous articles and several books on the family Cactaceae, including his monumental *The Cactus Family*, considered the most current treatment of the family Cactaceae.

The new taxa was discovered in Central Mexico by a team of cactus researchers of the National Autonomous University of Mexico (UNAM), led by Dr. Héctor Hernández. *Opuntia xandersoni* is the result of natural hybridization between a member of the Engelmann's prickly pear complex (*Opuntia engelmannii*) and the blinder prickly pear (*Opuntia microdasys*). Plants of this hybrid show characters intermediate to the putative parents, especially in habit, pads and number of spines, and have been found in numerous localities where both parents grow in the southern area of the Chihuahuan Desert. The distribution reported is mostly in the arid portions of the state of San Luis Potosí in desert flats with creosotebush (*Larrea tridentata*) and yucca (*Yucca filifera*). A full description of the new taxa was published in the journal *Haseltonia* (No. 9, 2002).

Coincidentally, while doing an inventory in the Core Garden, we found a plant with the characteristics of the same hybrid growing under a creosotebush and in the middle of a clump of lechuguilla (*Agave lechuguilla*). Looking around, we failed to find any accession tags, and no records of this particular hybrid are in our database. What we do have is a number of plants of both putative parents growing in the vicinity and our plant also shows a marked intermediacy of characters of both putative parents that matches very closely the description of *Opuntia xandersoni*. So, we can conclude that we have a good example of "facilitated" natural hybridization of *Opuntia* in our own garden, which is not surprising considering that the Desert Botanical Garden houses one of the best collections of the subfamily Opuntioideae in the world. Our plant has been accessioned (2004-0182) and vouchered and three pads are now in propagation.

The dedication of this new hybrid to Ted Anderson seems to be very fitting as a way of honoring one of the researchers who dedicated a good part of his career to the study of cacti. The fact that the same hybrid appeared spontaneously in our own garden seems to be Mother Nature's way of agreeing with this dedication. ☀



Photographs by Raul Puente

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on the Queen Mary II next June 9-20!**

For more information, call VanGuard
Tours & Cruises at 1-800-624-7718 and
mention Desert Botanical Garden.





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The Sonoran Quarterly | WINTER
December 2004 | Volume 58, No. 4

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Photograph by Charles Cobeen

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THE ARIZONA REPUBLIC presents
Las Noches de las Luminarias
at the Desert Botanical Garden

November 26-28	Open to the general public
December 2-4	Garden members & their guests
December 9-11	Open to the general public
December 16-23	Open to the general public

Holiday Teddy Bear Tea

Saturday or Sunday / December 11 or 12 / 12-2 p.m.
For reservations call 480-491-1225

*Desert Botanical Garden will be closed
on December 25*

Music in the Garden Spring Concert Series 2005

Sundays/January 30-March 13/12-2 p.m./Ullman Terrace

Flower Power

Saturday & Sunday / February 26 & 27 / 10 a.m.-3 p.m.

Maxine & Jonathan Marshall Butterfly Pavilion

March 11 — Members' preview
March 12-May 8 — Open to the general public

Spring Plant Sale

March 18 — Members' preview
March 19-20 — Open to the general public



Photograph by Gene Almindinger



Illustration by Randy Galloway



Photograph by Renee Immel



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The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.